Comment Documents and Res

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EXECUTIVE DIRECTOR

September 11, 1998

Mr. Bert Stevenson NEPA Compliance Officer U.S. Department of Energy P.O. Box 23786 Washington, D.C. 20026-3786

Dear Mr. Stevenson:

Enclosed please find comments from Texas research and regulatory bodies on the Department of Energy's Surplus Plutonium Disposition Draft Environmental Impact Statement. Those state regulatory agencies providing comments herein are tasked under a DOE Agreement in Principle to conduct environmental monitoring and emergency response planning in order to ensure the protection of human health and safety in the area surrounding the Pantex Plant near Amarillo, Texas. The comments of the Amarillo National Resource Center for Plutonium are also enclosed and represent the cooperative research efforts of a consortium comprised of three major university systems in Texas: The University of Texas System, The Texas A&M University System, and Texas Tech University.

Should you have any questions, please contact me at (512) 463-1877 or email <ru style="color: blue;">contact me at (512) 463-1877 or email contact me at (512) 463-1877 or email

Sincerely.

ROGER MULDER Director, Pantex Program

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EXECUTIVE DIRECTOR

August 11, 1998

Mr. Bert Stevenson NEPA Compliance Officer U.S. Department of Energy P.O. Box 23786 Washington, D.C. 20026-3786

Dear Mr. Stevenson:

Thank you for the opportunity to comment on the Department of Energy's Surplus Plutonium Disposition Draft Environmental Impact Statement. The State of Texas continues to support the Department's decision to pursue a dual track approach for the disposition of surplus plutonium. However, we believe it is in DOE's best interests to proceed in a manner that ensures broad acceptance for ultimate implementation of the dual disposition strategy.

The State of Texas is very proud of the work carried out at the Pantex Plant. Pantex and its thousands of dedicated, highly trained and motivated employees have made this nation a safer place to live, carrying out their primary mission of assembling and disassembling nuclear weapons. This same skilled workforce can apply its proven production culture and commitment to safety to the new mission of plutonium pit disassembly and conversion.

Because current and luture personnel of this new mission will require training on new procedures, Pantex has a unique safety advantage over other sites in that its workforce will require training, not re-training. Clearly, it is preferable to train individuals on a new system, rather than re-train personnel who are used to older systems with outdated procedures and requirements.

The highly trained and motivated Pantex workforce has forged a strong relationship with the Amarillo community. Its commitment to maintaining the integrity of the environment, to implementing proper protocols to ensure the safety of workers and the larger community, and to working closely with the local community have carned Pantex the role of a good neighbor. Pantex enjoys considerable community support and enthusiasm for new missions.



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MD188–1 Alternatives

DOE acknowledges the commentor's support for siting the pit conversion facility at Pantex and appreciates the community's strong support of Pantex. Decisions on the surplus plutonium disposition program at Pantex will be based on environmental analyses, technical and cost reports, national policy and nonproliferation considerations, and public input. DOE will announce its decisions regarding facility siting and approach to surplus plutonium disposition in the SPD EIS ROD.

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This support extends beyond the local community as well. Pantex has ample resources through the state and through the continuing research at the Amarillo National Resource Center for Plutonium to ensure the protection of human health and safety and the environment.

Pantex has another advantage in that it is currently storing more than 8,000 surplus plutonium pits. In addition to the compelling reasons such as the excellent safety culture and production culture already existing here at Pantex, it makes sense to carry out pit disassembly and plutonium conversion where the pits are already located. Selection of Pantex for pit disassembly and conversion should ensure some expediency in carrying out U.S. and international nonproliferation goals.

In view of Pantex's highly skilled workforce, its sound safety and production cultures, its existing mission of pit storage, and the extensive support which Pantex enjoys from the local community and from the state, I respectfully urge DOE to designate Pantex as the site for pit disassembly and conversion.

Thank you for the opportunity to comment in this important decision making process.

Sincerely

ROGER MIJLDER Director, Pantex Program .

Surplus Plutonium Disposition Fine

Surplus Plutonium Disposition Draft Environmental Impact Statement Comments

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Ian Scott Hamilton, Ph.D., CHP Texas A&M University Department of Nuclear Engineering College Station, TX 77843-3133

ENVIRONMENTAL CONSEQUENCES: SECTION 4.6

Choice of Baseline Pit Conversion Process.

The pit conversion process described as a basis for EIS analyses is a batch HYDOX process. In this process, the entire pit is converted into hydride, then a nitriding reaction is performed, and finally an oxidizing reaction. Each is performed as a separate step, converting a batch of plutonium from one chemical state to another. In contrast, the process described in the pit disassembly demonstration environmental assessment (DOE 1998) has the hydriding and nitriding steps occurring concurrently; a batch-sized quantity of powdered, pyrophoric plutonium hydride is never created. This has implications in the safety analysis since plutonium hydride is more reactive in air than plutonium nitride. Since batch quantities of pyrophoric plutonium hydride powder are not mentioned in the EIS, some question remains as to the process actually assumed for the EIS analyses.

Few Point Estimates of Accident Frequencies.

The SDPEIS presented point estimates of accident frequencies. Consequences to the public are multiplied by the associated frequencies to obtain estimates of societal risk. The draft SPDEIS (note: SP not SD) gives only broad ranges for most accident frequencies. Best point estimates of accident frequencies should be made, and societal risks calculated. This would provide a basis on which to compare risks from proposed facilities to those from existing facilities, as well as providing a basis to compare the risks from different siting decisions. The draft SPDEIS states that frequencies are reported only as broad frequency bins, since estimates of highly unlikely events can be on the order of several orders of magnitude. It is assumed that the draft SPDEIS is stating that the uncertainty associated with some frequency estimates is on the order of several orders of magnitude. The EIS continues on and states that consequence metrics have been preserved as the primary accident analysis results, with accident frequencies identified qualitatively, to provide a perspective on risk without implying an unjustified level of precision.

Risk is the product of frequency and consequence. Presenting only a consequence with a very broad frequency range does not provide a perspective on risk. Additionally, since the purpose of the EIS is to aid in selecting sites based on relative characteristics, absolute precision is less important than consistent analysis for different sites and disposition options. Blurring the frequency to a broad range, instead of presenting best point estimates consistent with other documentation, prevents risks from each site from being compared. An incorrect conclusion concerning the desirability of one site over another may occur due to the practice adopted in the EIS. Other environmental reports and safety analyses present point estimates for frequencies; the EIS should also.

MD188-2

Pit Disassembly and Conversion

The accident scenarios evaluated in this SPD EIS are based on the HYDOX process described in Section 2.4.1.2. A detailed discussion of the accident scenarios, methodology, and assumptions for the pit conversion facility is presented in Appendix K.1.5.2.1. These scenarios and assumptions are based on information provided in the *Pit Disassembly and Conversion Facility Environmental Impact Statement Data Reports* (June 1998) for each of the candidate sites. These reports are referenced in Chapter 2 (Volume I) of this EIS.

MD188-3 Facility Accidents

It is true that risk is the product of frequency and consequence. However, the decision to report frequencies in terms of a range does not prevent risks from each site from being compared. Instead, it recognizes the uncertainty (or range of uncertainty) in the frequency estimates. This is consistent with the guidance in Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements (DOE Office of NEPA Oversight, May 1993). Results are presented in such a way that risk differences shown in the results among alternatives reflect real, physical differences as opposed to definitional or methodological differences. Frequency differences arise primarily (1) when frequency estimates are different enough to warrant different risk categories; and (2) in the frequency of aircraft crashes. Pantex is the only site being considered where the aircraft crash frequency is greater than 1.0×10^{-6} , thereby warranting a quantitative analysis. With respect to consequences, a great deal of effort has been made by DOE to develop a consistent method of source term estimation, as documented in Airborne Release Fractions/Rates and Respirable Fractions for Nonreactor Nuclear Facilities (DOE-HDBK-3010-94, October 1994). The differences among sites for meteorology and population characteristics also have a clear and supportable physical basis.

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<u>Storage Quantity of Plutonium Oxide Powder</u> (probably the most important issue for the Panhandle, now)

The product of the HYDOX process is plutonium oxide powder. Storage issues were not addressed in the SDPEIS (I believe that the first 'S' stands for storage?). Due to the much greater hazard posed by plutonium oxide powder, as compared to the solid metal pit, Texas Report 1 contained the assumption that ten storage magazines would each contain 100 kg of plutonium oxide powder, for a total of 1,000 kg stored on site (but in locations external to the pit conversion facility). The draft SPDEIS reveals DOE plans to store 4,000 kg of plutonium oxide powder in the pit disassembly building vault, and 10,000 kg in the MOX facility storage vault. It is not clear if these inventories correspond to maximum design capacities of the vaults. Two initiators in the EIS (MCE and aircraft crash) have potentially large respirable releases associated with the storage vaults. DOE stated at the public meeting that they would definitely use the conversion process to a PuO₁ endpoint rather than just a Pu metal endpoint with a declassified shape. Therefore, this is the place that needs to be given the greatest consideration; the amount of powder stored directly affects the amount of material at risk for societal risk and agricultural impact characterization. That is, inhalation of plutonium is the most hazardous route of intake into the body. The committed effective dose equivalent resulting from inhalation of a given amount of plutonium is about 200 times that resulting from ingestion [5.0 x-05 Sv/Bq (absorption type M, Pu-239, Table 5.29.3(b) of ICRP 71, adult) divided by 2.5 X-07 Sv/Bq (adult, Pu-239, Table C-10.2 of ICRP 67)]. Processes and storage options that increase the amount of respirable material available for dispersal must be adopted cautiously, since the material is in a physical form that is easily inhaled if an accident should occur. Aircraft impact ARF and RF values.

The Draft SPDEIS Presents Less Conservative ARF and RF Values.

On the basis of limited data concerning particle sizes, an arithmetic average of the particle sizes resulting from ten trials is taken (a reference document, Mishima et. al., is so new that we don't have it and it is used for the basis of this calculation). Variation in the fraction of powder less than 10 microns AED varies by four orders of magnitude. Since process details are still being developed, it would seem prudent to select a bounding value. Instead, an average is taken, resulting in a ten-fold reduction in apparent consequences and risks. This is not conservative, especially considering the developmental nature of the process. It is also not consistent with the Pantex Zone 4 FSAR and other safety documents that typically take bounding values, rather than typical values. Exclusion of seismic events beyond DBEs. As in the SDPEIS, there appears to be confusion concerning credible accidents and design basis accidents in the draft SPDEIS. The premise that credible earthquakes are only those with frequencies greater than 1 in 10,000 is inconsistent with other DOE safety analyses and standards. For example, DOE-STD-1023 differentiates between the maximum credible carthquake (MCE) and design basis earthquake for a site. The MCE is more severe than a design basis earthquake, but still credible. Effects from credible earthquakes greater than the design basis earthquake are considered in the Rocky Flats Building 707 environmental assessment and the Pantex Zone 4 FSAR.

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Facility Accidents

The inhalation of respirable plutonium from a plutonium dioxide powder release is of primary significance to doses resulting from accidents. The SPD EIS accident analyses recognized this and developed source terms conservatively by focusing on powder process areas appropriate to the characterization of bounding scenarios. The assumed quantities of plutonium dioxide powder in storage at the time of accident initiation are anticipated administrative maximum quantities, and are therefore conservative.

MD188-5 Facility Accidents

As recommended by the commentor, and consistent with DOE-HDBK-3010-94, Appendix K.1.5.1 was revised to reflect the use of a respirable fraction of 0.2 for aircraft debris impact into plutonium dioxide powder. This SPD EIS does not exclude seismic events beyond the design basis earthquake. In fact, a beyond-design-basis earthquake was specifically postulated to account for the fact that ground motions in the extremely unlikely to beyond extremely unlikely range (i.e., in the range of 1.0x10⁻⁶ to 1.0x10⁻⁷ per year) could be significantly larger than ground motions from a design basis earthquake, which has a defined annual frequency of 5.0x10⁻⁴ (1.0x10⁻³ at LLNL, since it is near a tectonic plate boundary). Appendix K.1.5.1 states that the magnitude of potential earthquakes with return periods greater than 10,000 years is highly uncertain. For purposes of this EIS, it was assumed that at all the candidate sites, earthquakes with return periods in the 100,000-to 10-million-year range might result in sufficient ground motion to cause major damage to even a modern, well-engineered, and well-constructed surplus plutonium disposition facility.

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Worker Doses Calculated at a Distance of 1,000M

Most other safety analyses calculate non involved worker dose at 100 m. Transportation (Appendix L) uses distances of 100 m (neutral meteorology) and 90 m (stable meteorology) for the maximally exposed individual for accidents. In the EIS, it is unclear why doses can be calculated at distances of a football field for transportation accidents, yet not for onsite accidents. Obviously, at the Pantex Plant, there are many non involved workers within ten football fields of the facility. Doses to workers would, in general, be much higher at 100 m than at 1,000 m.

6

HEPA Filter Integrity

HEPA filter efficiencies of 0.999 and 0.99 were assumed during accidents. The resulting leak path factor (LPF) is 1.0x10-5, twenty times the value used in the SDPEIS (2x10-6). The EIS values are closer to efficiencies of 0.99 and 0.995 recommended in recent literature.

Much lower efficiencies may result when filters are challenged by pressure pulses (even those less than the amount needed to damage the filter may result in much lower efficiency), wetting, or aging. Further analysis requires more details of the proposed design. The chances that the system will perform during an accident are enhanced if there is redundancy. The consequences of many accidents become very severe if the HEPA filters are damaged or degraded significantly in filtration efficiency. Careful design and construction is essential to ensure the integrity of the filters.

Different Accident Suite

Some of the accident scenarios presented in the SDPEIS are no longer considered in the draft SPDEIS. These include the dock fire and oxyacctylene explosion scenarios. These accidents were the most risk-significant in the SDPEIS and in our assessment. It would be nice to see a qualification as to DOE's commitment to reduce overall risk by "proceduralizing out" the latter hazard, rather than leaving one to wonder if it was an oversight or omission. The former hazard is duly explained by the newer design information, as long as they aren't going to leave material sitting out prior to shipment - perhaps another procedural qualifier would be good.

REFERENCES

(DOE 1996) U.S. Department of Energy. Storage and disposition of weapons-usable fissile materials final programmatic environmental impact statement. Washington, DC: U.S. Department of Energy, DOE/EIS0229; 1996.

(DOE 1998) Pit disassembly and conversion demonstration environmental assessment and research and development activities, Preapproval review, DOE/EA-1207-D, May 1998.

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Facility Accidents

In general, it is true that doses would be higher at 100 m (330 ft) than at 1,000 m (3,281 ft). This trend is acknowledged in Appendix K.1.4.1, which states that a worker closer than 1,000 m (3,281 ft) to the accident would generally receive a higher dose; a worker farther away, a lower dose. However, this trend is not absolute; for an elevated release (which many of the releases evaluated in this SPD EIS are), doses tend to decrease closer to the release point because the plume is above the receptor. Also, for ground-level releases from an existing building, the chaotic nature of building wake effects makes estimates of doses highly uncertain for distances less than approximately 100 to 200 m (330 to 656 ft). DOE acknowledges that doses to some workers may be higher than those estimated for the maximally exposed worker at 1,000 m (3,281 ft). However, there is no fixed distance at which doses to workers are maximized. Thus, a reference distance must be picked as a point of comparison among alternatives. This EIS selected 1,000 m (3,281 ft) (or the site boundary, if less than 1,000 m [3,281 ft] away) as reasonable, based on its use in the Storage and Disposition PEIS. A distance of 100 m (330 ft) is used in the transportation accident analysis to nominally define a public dose for purposes of comparison. This is appropriate for transportation accidents because it is assumed that the public is in the immediate vicinity of the accident (public roads). It is also technically feasible because the transportation accident is assumed to be a ground-level, nonbouyant release, and there are no significant wake effects at 100 m (330 ft) due to the bulk of the trailer.

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Facility Accidents

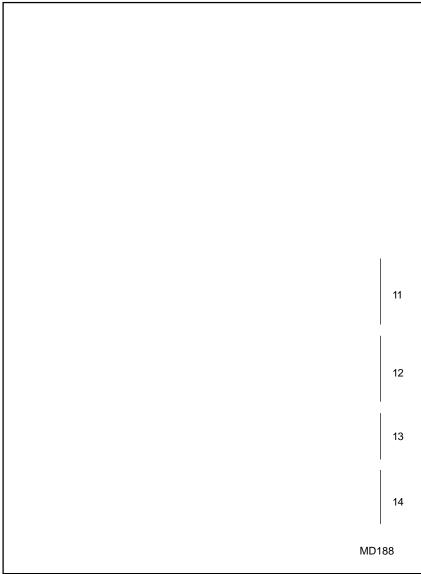
DOE acknowledges the importance of HEPA filter effectiveness in mitigating accident consequences. For the purposes of the accident analysis in this SPD EIS, only two of the three stages of HEPA filters are assumed to work during all the design basis accidents. For such accidents, the two stages are assumed to have a combined efficiency of 99.999 percent. One major consideration in the development of the beyond-design-basis accidents analyzed in this SPD EIS was the need to characterize consequences in cases where the building HEPA filtration fails. The beyond-design-basis seismic

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event assumes that building HEPA filtration is altogether unavailable; the beyond-design-basis fire also assumes that HEPA filtration is unavailable due to clogging of the HEPA filters from smoke or wetting. The statement is incorrect that the HEPA filter leakpath factor in this EIS is 20 times the corresponding factor in the *Storage and Disposition PEIS*; it is 5 times greater. As discussed in Appendix K.1.5.1, Accident Scenario Consistency, the value of $1.0x10^{-5}$ was selected as the more conservative of the values supplied in the data reports.

MD188–8 Facility Accidents

Appendix K was revised to show that the suite of generic accidents in the *Storage and Disposition PEIS* was considered in the analysis of accidents for this SPD EIS. However, the more detailed design information in the surplus plutonium disposition data reports was the primary basis for the identification of accidents because that information most accurately represents the expected facility configuration. Accidents such as the fire on the loading dock and the oxyacetylene explosion in a process cell were deemed to be unsupported by this information, so were not included in this EIS.



MD188–11 Immobilization

DOE is interested in converting plutonium pits and plutonium metal to an oxide because an oxide is more stable and is further removed from usability in a nuclear weapon.

MD188-12 General SPD EIS and NEPA Process

DOE acknowledges the commentor's position regarding the safe handling of hazardous materials.

MD188-13 General SPD EIS and NEPA Process

DOE acknowledges the commentor's appreciation of this SPD EIS.

MD188–14 Facility Accidents

To understand the commentor's concerns, an additional paper (*Improving Aircraft Accident Forecasting for an Integrated Plutonium Storage Facility* [ANRCP-1998-6, June 1998]) by Dr. Rock, Dr. McNerney, Ms. Kiffe, and Ms. Turen was reviewed. DOE disagrees with the conclusions of the paper that a two-thirds reduction of crash frequency due to in-flight operations is appropriate because the details of the calculation in this EIS are not accurately represented in the paper. In any event, a frequency of 1.0×10^{-7} per year is still in the same qualitative category as that of an aircraft crash at Pantex in this SPD EIS, and the frequency specification of "beyond extremely unlikely" would remain unchanged.

Although cost will be a factor in the decisionmaking process, this SPD EIS contains environmental impact data and does not address the costs associated with the various alternatives. A separate cost report, *Cost Analysis in Support of Site Selection for Surplus Weapons-Usable Plutonium Disposition* (DOE/MD-0009, July 1998), which analyzes the site-specific cost estimates for each alternative, was made available around the same time as the SPD Draft EIS. This report and the *Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document* (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, are available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS and Washington, D.C.

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Analysis," ANRCP 1998 Researchers' Conference Proceedings.) Proper application of this principle will show, I believe, that the aircraft accident risk at Pantex is no higher than at Savahana River. My colleague, Dr Mike McNerney of the University of Texas Transportation Research Center, is nearly finished analyzing a one year record of all aircraft operations tracked by the RAMS radar data acquisition system in the Amarillo Airspace. That data should be the source data for the final EIS. Second, in life cycle cost exercises such as those identified in the draft EIS, it is important to consider all costs. It is an unavoidable fact of life that cleanup of existing contamination is paid for from operational budgets in government agencies as well as in industry. Therefore, please include the present value of deferred cleanup costs at Savannah River when you revise the draft EIS. The economic analysis should show lower costs for conversion at Pantex because it will not have to add the overhead costs of deferred cleanup that must be added at Savannah River.

I want to tell you all how proud I am tonight to be an American. I am proud to be part of this public meeting that allows each of us to present facts and to ask questions that will help insure the best possible decision as we, together, move forward in the larger goal of nuclear disarmament of the human race. Let me reflect briefly to some comments we have heard today.

Many of these comments have portraved DOE in very bad light. Some citizens seem to believe that DOE has no concern for safety, health or the environment. Though it has many blemishes on its records and has by its past actions earned some title to such criticism, there is a bright side to the story, a side that hasn't been told here today. From the beginning of the nuclear weapons program in agencies that predate the DOE, concern for safety was very high. Laboratory Safety hoods and glove boxes were both invented to protect workers from the hazards of toxic and radioactive materials essential to our nuclear weapon's program. These are now essential components of modern chemical, pharmaceutical and semiconductor industries. High efficiency particulate filters, the HEPA filters, were invented in our national laboratories. Without these filters we would not be able to manufacture modern semiconductor devices and many other high technology products. Modern industrial respirators are based on research conducted since the late 1960s at Los Alamos National Laboratories. Their work was so singular, that our National Institute of Occupational Safety and Health contracted with LANL for their fundamental respiratory protection research needs. We have also heard today about the health hazards associated with Beryllium with some allegations sounding as if its only use is in nuclear weapons. The truth is that our knowledge of Berylliosis comes from three sources. It is used in the nuclear industries where its low density and high neutron cross section are essential, is used in electronic industries where its high electrical and thermal conductivity are essential, and it is used in the aerospace industries where its high strength to weight ratio is essential. For those who want more information, may I suggest an excellent book: Beryllium, Biomedical and Environmental Aspects, Rossman, M.D., O.P. Preuss, M.B. Powers, eds. Williams & Wilkins,

In conclusion, it is a truism in academia that true synthesis comes only when thesis collides with antithesis. Today, I am hearing dialogue between concerned citizens and representatives of our government. Heave this microphone confident that better solutions for the nation will come from this meeting. Truly, together we can progress faster and more safely than we could by working alone or by working in destructive opposition. Thank you, Mr Chairman, for allowing me to speak today.

MD188-15 Other

DOE acknowledges the commentor's remarks concerning DOE's public image, technical innovations, and various applications for beryllium.

Comment Documents and Responses—Texa

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Specification of "can-in-canister" immobilization as a preferred alternative.

GENERAL SERVICES COMMISSION

DOE is proposing "can-in-canister" immobilization as its preferred alternative for immobilization. However, the DOE's own reports! 'indicate that "can-in-canister" immobilization does not currently meet the Spent Fuel Standard for long-term nonproliferation resistance. The United States must deploy an effective, accepted plutonium disposition technology or technologies if it wants to encourage international support for plutonium disposition. Duke expects that concurrent action on the part of Russia to dispose of its surplus plutonium will be predicated on the disposition of United States material in a manner that provides high confidence in its resistance to theft, diversion, or re-use.

Recommendations.

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- DOE should consider only those alternatives that meet the Spent Fuel Standard [i.e., mixed oxide (MOX) fuel and homogeneous immobilization] as preferred alternatives.
- If the DOE pursues deployment of "can-in-canister" immobilization, the DOE should explain how it will demonstrate, in an open, objective, and peer-reviewed process, that the "can-in-canister" plutonium disposition approach will meet this fundamental program requirement - the Spent Fuel Standard.

Quantities of plutonium considered in the EIS for disposal using the two approaches.

The draft EIS states, "Since the ROD was issued, however, DOE has determined that an additional 9 tonnes of low plutonium content materials would require additional processing and would, therefore, be unsuitable for MOX fuel fabrication." DOE alternatives include disposing of a maximum of 33 tonnes of plutonium as MOX fuel, while the alternatives include immobilizing 50 tonnes of surplus plutonium.

DOE has never provided justification that any surplus plutonium is not suitable for MOX use. The DOE has not explained what form this "unsuitable" plutonium is in. The technology descriptions in the draft EIS make it clear that various kinds of processing will be used in the Conversion and Immobilization Facility. It would appear to be possible that some of this processing would render material that is suitable for fabrication into MOX fuel. Finally, the DOE has specified no requirements that the plutonium destined for either MOX fuel or immobilization must satisfy. Therefore, it seems very unlikely that there is any technical basis for any decision about quantities of plutonium that are suitable or unsuitable for either option.

Recommendation.

Given the lack of justification for any decision about quantities of material for the two options, DOE should include the evaluation of a 100% (50 tonne) MOX fuel alternative in the SPD EIS. This is the only way to preserve all appropriate options until the time that the DOE can make a technically defensible evaluation and decision on the allocation of material to the two plutonium disposition approaches.

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MD188–16 DOE Policy

In the Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Material Storage and Excess Plutonium Disposition Alternatives (DOE/NN-0007, January 1997), DOE identified two potential liabilities of the immobilization alternatives relative to the Spent Fuel Standard. These liabilities involve ensuring sufficient radiation levels and removal-resistant can-in-canister designs. Since that time, DOE has modified the can support structure inside the canisters and has focused its research on the ceramic form of immobilization. As part of the form evaluation process, an independent panel of experts determined (Letter Report of the Immobilization Technology Peer Review Panel, from Matthew Bunn to Stephen Cochran, LLNL, August 21, 1997) that the can-in-canister design would meet the Spent Fuel Standard. In addition, NAS is currently conducting studies to confirm the ability of the ceramic can-in-canister immobilization approach to meet the Spent Fuel Standard. DOE is confident that immobilization remains a viable alternative for meeting the nonproliferation goals of the surplus plutonium disposition program.

MD188-17 Feedstock

Pursuing both immobilization and MOX fuel fabrication provides the United States important insurance against potential disadvantages of implementing either approach by itself. The hybrid approach also provides the best opportunity for U.S. leadership in working with Russia to implement similar options for reducing Russia's excess plutonium in parallel. Further, it sends the strongest possible signal to the world of U.S. determination to reduce stockpiles of surplus plutonium as quickly as possible and in a manner that would make it technically difficult to use the plutonium in nuclear weapons again.

DOE reviewed the chemical and isotopic composition of the surplus plutonium and determined in the *Storage and Disposition PEIS* ROD that about 8 t (9 tons) of surplus plutonium were not suitable for use in making MOX fuel. Furthermore, DOE has identified an additional 9 t (10 tons) for a total of 17 t (19 tons) that have such a variety of chemical and isotopic compositions that it is more reasonable to immobilize these materials and avert the processing

Sandia National Laboratories, SAND97-8203 - Proliferation Vulnerability Red Team Report, October 1996

² U. S. Department of Energy, DOE/NN-0007 - Nonproliferation and Arms Control Assessment of Weapons-Usable Fissile Material Storage and Excess Plutonium Disposition Alternatives, January 1997.

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Fast Flux Test Facility (FFTF).

It is not clear that using the FFTF to destroy nuclear weapons material (plutonium) would be acceptable to the international community if, at the same time, the facility was producing another kind of nuclear weapons material (tritium).

Pagammandation:

In discussing the use of the FFTF for a combined plutonium disposition and tritium production mission, DOE should acknowledge that there is a significant nonproliferation issue associated with such a course of action.

Fast Flux Test Facility (FFTF).

The appendix states "If it were determined that MOX fuel (rather than uranium-only fuel) were needed for the FFTF operations, the MOX fuel fabrication alternatives may be eliminated, depending on the amount of surplus plutonium that would be required for tritium production." However, it is our understanding that the capability to fabricate significant quantities of MOX fuel for the FFTF does not currently exist within the DOE complex.

Recommendation

DOE should acknowledge that use of the FFTF with plutonium fuel in this manner would require the design and construction of a MOX fuel fabrication facility for the FFTF fuel. It is the light water reactor irradiation of MOX fuel that might be eliminated by such a course of action.

Hot cell examinations of irradiated lead assembly fuel.

The environmental impacts in the draft EIS do not appear to include those impacts associated with hot cell examinations. In particular, there is no acknowledgement that the hot cell facilities would be responsible for the disposal of the spent nuclear fuel that results from destructive hot cell examinations.

Recommendation:

DOE should revise the EIS to include these impacts, or note that such impacts are already included in other environmental evaluations.

complexity that would be added if these materials were made into MOX fuel. The criteria used in this identification included the level of impurities, processing requirements, and the ability to meet the MOX fuel specifications. Therefore, fabricating all 50 t (55 tons) of surplus plutonium into MOX fuel is not considered a reasonable alternative at this time.

While it is possible to use impure plutonium in MOX fuel, the incremental burden to do so is unnecessary and complicates the MOX approach. A description of the types and amounts of plutonium currently planned for disposition can be found in *Feed Materials Planning Basis for Surplus Weapons-Usable Plutonium Disposition* (MD-0013, April 1997).

MD188–18 DOE Policy

As discussed in Section 1.7.4, Appendix D was deleted because none of the proposals to restart FFTF currently consider the use of surplus plutonium as a fuel source. In December 1998, the Secretary of Energy decided that FFTF would not play a role in producing tritium.

MD188–19 DOE Policy

As discussed in Section 1.7.4, Appendix D was deleted because none of the proposals to restart FFTF currently consider the use of surplus plutonium as a fuel source. DOE agrees with the commentor that the LWR irradiation of the MOX fuel could be eliminated should there be a proposal to restart FFTF using surplus plutonium as a fuel source; however, the timeframe in which it could be accomplished is longer than that currently being proposed by the consortium using commercial reactors.

MD188–20 Lead Assemblies

The two DOE sites, ANL–W and ORNL, proposed for postirradiation examination conduct these types of activities on an ongoing basis. Impacts of activities associated with the postirradiation examination of lead assemblies are discussed in Section 4.27.6. Spent fuel after postirradiation examination would be the responsibility of the DOE spent nuclear fuel program. As stated in the ROD for the *DOE Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory*

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Dr. Michael T. McNerney, P.E. The University of Texas at Austin Austin, TX 78705-2650

COMMENTS ABOUT THE SURPLUS PLUTONIUM

In addition to the oral comments submitted in the public meeting on August 10, 1998, I have the following written comments on the Surplus Plutonium Disposition Draft Environmental Impact

- · Reading the EIS, I noticed that in several areas it declares that all the sites to be considered except Pantex meet certain levels of potential aircraft crash probability. The oral response in the public meeting indicated that Pantex statement was a result of the November 1996 EIS for Continued Operation of the Pantex Plant. My point is that the previous EIS was conducted before the DOE standard for evaluating aircraft crash probability was finalized, and my research indicates that the analysis thoroughly over estimated the types and amount of traffic landing at Amarillo and from errors in the development of the standard related to military aircraft crash rates thoroughly overestimated the likely hood of an aircraft crash into the Pantex site. The point being that the previous analysis that was done is in error and should not be used to exclude Pantex in any way from the new mission and therefore the statement should be amended or removed from the document.
- In support of this assertion that the previous analysis overestimated the aircraft crash probability, I offer the following data:
 - In the previous EIS, the most significant crash probabilities were related to takeoff and landings of military aircraft. The analysis used radar data (RAMS) collected at Amarillo Airport as analyzed by Dr. Lin of Sandia Laboratories.
 - We have reviewed all the RAMS data and rewritten the FORTRAN program that analyzes the tracks to determine high altitude versus landing aircraft and found an order of magnitude reductions in the large military aircraft landing at Amarillo. We reduced the number of unknown category of flight tracks by a factor of three or more. We now have the most accurate database of aircraft operations at Amarillo Airport.
 - Using this database of aircraft traffic and using the DOE standard and support documentation crash rates (Which are also in error on the conservative side) for actual military aircraft types flown into the Amarillo airspace, we determined that the small military rates were 9 and 8 times overstated for zones 4 and 12 respectively. The large military aircraft crash probability were overstated in zones 4 and 12 by 2 and 4 times
 - Using these new aircraft specific traffic data, the probability of an aircraft crash by the general aviation single engine piston category of aircraft is three and one half times more likely to crash into Pantex than the small military category and 14 times more likely than
 - The DOE standard, which was finalized after the previous EIS, has not been validated by outside review and is overly conservative in all categories. My research has determined that there are significant errors in the adoption of military crash rates. Error where made in the interpretation of Air Force accident descriptions as to classifying landing accidents, interpreting the location data of accidents, and in calculating the number of landings and landing approaches for aircraft types.

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Environmental Restoration and Waste Management Programs Final EIS (DOE/EIS-0203-F, April 1995), interim storage for this type of spent fuel would take place at INEEL before eventual disposal in a potential geologic repository.

MD188-21

Facility Accidents

The oral response provided in the public hearing did not fully answer the question. The Final Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components (DOE/EIS-0225, November 1996) was used to determine the operations of each aircraft type. The other remaining factors were from the DOE standard, Accident Analysis for Aircraft Crash Into Hazardous Facilities (DOE-STD-3014-96, October 1996), and calculations from equations in that standard. The aircraft crash evaluation used operations data from the Pantex EIS because it was the best available data at the time of the analysis for this SPD EIS.

In response to the claims about having the "most accurate database of aircraft operations at Amarillo Airport," until those data are verified by DOE and made available in a published document, the Pantex EIS operations data are considered the best known published operations data for Amarillo Airport. This SPD EIS disregarded any contribution from general aviation aircraft because the proposed surplus plutonium disposition facilities would be designed to withstand a general aviation aircraft impact. Figure 4 in the DOE-STD-3014-96 data document describes at least 68 small military off-runway accidents around the U.S. These crashes are included in the basis for the crash location density function. The arguments for a reduction of the frequency of 9 or more for in-flight crashes are not provided. The analyses are based on DOE-STD-3014-96 and are considered to be appropriate and adequate for the comparison of the alternatives being considered in this EIS.

- After reviewing the supporting data from all US Air Force crashes from 1979 to 1993, my analysis shows that only one landing crash occurred outside of 4 miles from the runway. In that accident, an F-111 aircraft crashed at nine miles as a result of an unusual stuation where one engine was shut down during an emergency approach and the afterburner failed to light on the good engine resulting in the crash. Since all F-111 aircraft have now all been retired from Air Force service it ceases to be a problem and should not constitute a data point in the calculation of crash probability distribution functions for military aircraft.
- There is no data that supports that military aircraft landing accidents have any probability
 of crash into the Pantex site which is over 10 miles from the Amarillo Runway, let alone
 be the single highest risk factor.
- The inflight calculated crash rates in the DOE standard as applied to Pantex are overly
 conservative and I would argue that they should be reduced by a factor of nine or more as
 applied to the location of Pantex.

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John M. Sweeten, Ph.D., P.E. Texas Agricultural Experiment Station Texas A&M University Agricultural Research and Extension Center Amarillo, TX 79106

At the request of the Amarillo National Resource Center for Plutonium, a consortium of the Texas A & M University System, the University of Texas System, and Texas Tech University, I have reviewed the 4-part document A Surplus Plutonium Disposition Draft Environmental Impact Statement: Summary, Volume I-Part A, Volume I-Part B, and Volume II@, U. S. Department of Energy, Washington, D. C., July, 1998.1,500 p. While my review of the Surplus Plutonium Disposition (SPD) Environmental Impact Statement (EIS) was focused on those parts relating specifically to the Pantex Plant and to the environmental quality assessment and impact considerations, a general review was given also to other locations under consideration.

The analysis of the 23 alternatives articulated and presented for review was thorough and balanced with respect to the various sites under consideration. I understand that some of these alternatives are no longer under consideration subsequent to a DOE recent decision to locate the fuel rod assembly fabrication process using plutonium oxide at Savannah River Site (SRS) which is the point of proposed final utilization in an existing nuclear power plant. This decision constrains the selection of alternatives involving Pantex to only those involving (a) current mission of long-term plutonium pit storage with upgrades, (b) pit disassembly, and (c) pit conversion of Pu into plutonium dioxide, a component along with uranium dioxide of eventual Mixed Oxide (MOX) fuel rods fabricated at SRS. In essence the remaining alternatives involving Pantex are as follows (n=8): Alternatives 1, 4A, 4B, 5A, 5B, 11B, 12C, and 12D.

I do not view Alternative I (No Action) as a viable option, in that the estimated half-life of plutonium in its present form is some 24,000 years. This is a long time for governments, militaries and taxpayers to guard and protect from terrorism, accident, environmental and natural resource damage, and human tragedy some 50 metric tons of active fissile material that has commercial value as well as obvious destructive potential. This potential Alegacy@ should not be left for future generations of Texans and other Americans. The 1:1 leveraging opportunities with the former Soviets with respect to their disassembled and stored fissile materials would be lost as well. The other 22 alternatives would put all this behind us by the year 2015, or with typical public works delays by the year 2020-2025 at least. The Panhandle, Texas, America and the world then will be a safer place.

So the question really becomes two-fold:

- a) is the presently-proposed suite of technologies adequate to perform the plutonium handling and conversion safely and effectively?; and
- b) is it environmentally secure?

I will defer the former question to the involved experts in nuclear engineering, nuclear physics, chemical engineering, occupational health and safety, and other relevant fields.

Regarding the second question, my involvement over the last 18 months with ANRCP technical staff and a team of experts evaluating and providing risk assessment for the Pu/MOX fuel conversion process, together with my reading of the SPD EIS document itself suggests that, with the data presented so far, the remaining alternatives involving Pantex can be carried out in an environmental secure manner. The probabilities, exposure, and health

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General SPD EIS and NEPA Process

DOE acknowledges the commentor's positions on environmental impacts at Pantex, as well as the interest of the organizations mentioned. The environmental analysis reflected in this SPD EIS involved the consideration of relevant and available information.

Technologies proposed for the disposition of surplus plutonium are described in Sections 2.3 and 2.4; environmental impacts of the implementation of those alternatives, in Chapter 4 of Volume I. As more information becomes available it will be posted to DOE's Web site at http://www.doe-md.com.

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effect numbers are very, very small. The land area that would be affected by worst-case scenarios involving release of Pu to the environment are very small, contained within site boundaries, and off-site impacts would be practically negligible.

Nevertheless, there is necessary and continuing involvement by agricultural scientists and engineers with the agencies affiliated with the Cooperative Research, Education, and Extension Triangle for the Panhandle (Texas Agricultural Experiment Station, Texas Agricultural Extension Service, West Texas A & M University, USDA-Agricultural Research Service, and Texas Veterinary Medical Diagnostic Laboratory), joined by our colleagues at TAMU-College Station and at the TAES Blacklands Research Center at Temple, in providing new data, information, questions, answers and dialogue from the perspective of agricultural production and processing, including soil/water/plant/animal/wildlife relationships. We are interested as well in impacts on water, soil and air resources from the perspective of rural residents and communities. Our concerns with maintaining the viability of crop, feedlot, range and pasture production systems as part of the human food chain, and of those who operate them, is paramount. The recent, current and future scientific projects with ANRCF sponsorship and involvement reflect those concerns and provide answers that should be taken into account with regard to the present SPD EIS and future plant design and operations. We are available for continuing dialogue and partnerships involving scientific discovery, interpretation, exchange, and education in these areas.

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In terms of the EIS document itself, my remarks will be restricted to only a few areas at this time.

*Summary, Section S.5.-Topics analyzed in the SPD EIS are appropriate: air quality, noise, waste management, socioeconomics, human health risk, facility accidents, transportation, environmental justice, geology and soils, water resources, ecological resources, cultural and paleontological resources, land use and visual resources, and infrastructure. However, agricultural production systems are not addressed for any of the potential sites, all of which sit in or adjacent to extensive crop and livestock production appropriate to the regions.

*Chapter 2. Alternatives for Disposition of Surplus Weapons-Usable Plutonium-

- Page 2-3-- As noted above, several of these alternatives can be eliminated with recent decisions regarding the SRS mission, namely Alternatives 2, 4A, 4B, 6A, 6B, 6C, 6D, 7A, 7B, 8, 9A, 9B, and 10.
- Pages 2-4 to 2-7--From the maps, every site except Pantex has at least one river running through or adjacent to it.

*Chapter 3. Affected Environment--

Section 3.1, Approach to Defining the Affected Environment—the Region of Interest
(ROI) did not directly include agricultural resources or production practices for any of
the candidate sites. If environmental damage were to occur despite safeguards, the
public would be very interested in food supply and food chain safety issues, and
farmers/livestock producers would be directly affected in terms of restrictions on future
production practices or marketing opportunities. These are an important considerations.

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MD188–23 Socioeconomics

Incident-free (normal) releases of radioactivity from the proposed surplus plutonium disposition facilities to the food production chain are explained for each candidate site in Appendix J. Current and future operations at any of the candidate sites are not expected to impact the soil used for agriculture and farming in any regions adjacent to these candidate sites. The potential impacts of the proposed facilities on prime farmlands are also evaluated in the Geology and Soils portions of Section 4.26. All activities would be limited to each of the candidate sites, and any impacts on the surrounding areas would be within Federal, State, and local regulatory limits.

Section 4.26 and Appendix K were revised to discuss potential impacts of radioactive emissions on agriculture and water resources.

MD188–24 Candidate Sites

DOE's preference for siting the MOX facility at SRS is not a decision. The alternatives cited by the commentor remain reasonable alternatives until the SPD EIS ROD is issued. However, DOE eliminated as unreasonable the 8 alternatives that would involve use of portions of Building 221–F with a new annex at SRS for plutonium conversion and immobilization, thereby reducing the number of reasonable alternatives to 15 that are analyzed in the SPD Final EIS. Table 2–1 was revised to reflect the deleted alternatives: 3B, 5B, 6C, 6D, 7B, 9B, 12B, and 12D. Alternative 12C was renamed 12B.

DOE acknowledges the commentor's statement that every candidate site, except Pantex, has at least one river running through or adjacent to it.

MD188-25 Socioeconomics

Section 3.1 defines the ROI for the affected environment for human health risks to the general public from exposure to airborne contaminant emissions as an area within an 80-km (50-mi) radius of the proposed surplus plutonium disposition facilities. The analyses in Appendix J consider the potential contamination of agricultural products and livestock, and consumption of these products by persons living within an 80-km (50-mi) radius of the

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- Section 3.4, Pantex Plant, Pages 3-88 to 3-124--the extensive agricultural production practices and programs within a 9-county area around Pantex nor adjacent to the site were not discussed or data listed. This information was provided to the ANRCP in January 1998 in a contract project final report and needs to be presented or summarized herein. The agricultural data should include: crops (types and acreage), soil management practices, livestock grazing (rangelands and wheat pasture), cattle feedlots including sources of feedstuff supplies, beef slaughtering and processing facilities, and grain storage. Dairies, horses swine, poultry, and other species of relevance are not identified as well. Potential secondary pathways of possible contamination--e.g. non-point source runoff, wind erosion, water erosion, etc. - are not addressed. Similar information should be provided for all the other candidate sites in the respective sections within the Regions of Interest. For example, fruit, vegetable, cattle and dairy production are prominent in Idaho and Washington state in general vicinity of INEEL and Hansford plants, respectively, and South Carolina is a poultry production state. Also, no mention is made of local management districts for groundwater and surface water resources; these include the Panhandle Ground Water Conservation District No. 3, White Deer, which encompasses an 8-county area including

*Chapter 4, Environmental Consequences--The forgoing comments for Chapter 3 generally apply to this chapter as well.

- Section 4.6, Alternative 4A-Indicates that the air quality impacts will be minimal along with waste management, human health, or water resource risks. Increments added by operation of the pit conversion at Pantex will be non-existent or minimal (Table 4-5 vs. Table 4-58), and resultant site concentrations will be far below EPA or TNRCC ambient air quality standards for most contaminants and below EPA NAAS for PM10 on both an annual and 24-hour averaging time basis.

radioactivity in grain crops, forage, and animals (and the resultant effects on ingestion doses to humans), and all potential dose pathways including direct ingestion, inhalation, external ground exposure, and plume immersion. These analyses indicate that the potential impacts of normal operation of the pit conversion, immobilization, and MOX facilities on agricultural products, livestock, and human health at any of the sites would likely be minor. The analysis takes into account plutonium doses; bioaccumulation of radioactivity in grain crops, forage, and animals (and the resultant effects on ingestion doses to humans); and all potential dose pathways including direct ingestion, inhalation, external ground exposure, and plume immersion. Transience consideration would have a negligible effect on dose results. Although specific agricultural data were not identified for each candidate site in Chapter 3 of Volume I, the 1987 Census of Agriculture was used as the source to generate site-specific data for food production in Appendix J for each of the candidate sites.

candidate sites. The analyses of doses consider bioaccumulation of

Section 3.4.7.2.1 states that Pantex is in the Panhandle Groundwater District 3, which has the authority to require permits and limit the quantity of water withdrawn. Impacts of releases of radioactivity from the proposed facilities at each candidate site on the food production chain are discussed in Appendix K. Section 4.26 and Appendix J were revised to discuss potential impacts of radioactive emissions on agriculture and water resources.

The remainder of this comment is addressed in response MD188–23.

MD188-26

Air Quality and Noise

DOE acknowledges the comment.

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*Appendix F, Impact Assessment Methods, and Appendix G, Air Quality--

- Does not include information for any site concerning:
- agricultural production practices
- accidental releases-explosion, fires, spills, etc.
- dispersion modeling
- areas affected
- redistribution of particulates from Pantex by water or wind erosion.

*Appendix I, Socioeconomics

 Does not include discussion concerning agricultural production, land use, or rural residents including whether or not they could be affected. 25

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*Appendix J, Human Health Risks--

- The agricultural data mentioned (from the 1987 Census of Agriculture) but not shown should be presented for all four sites. This information should be presented in a separate Amendix
- Other agricultural data sources or more recent vintage than the Census of Agriculture are readily available as well, from entities such as the State Crop and Livestock Statistical Services, the Cooperative Extension Services (e.g. Texas Agricultural Extension Service), the USDA-Farm Services Agency, etc..
- Analysis does not appear to take into account Pu doses, transience, or effects on field grain crops, forages, or animals, nor contamination pathways other than direct ingestion.

The opportunity to review and comment on the SPD EIS document is appreciated. I hope these remarks are useful in strengthening the document and provide the basis for continuing development of greater scientific information regarding the environmental quality for Pantex and other sites in other locations also.

MD188-27

Air Quality and Noise

There are no changes in agricultural production practices associated with any of the alternatives. The remainder of this comment is addressed in responses MD188–23 and MD188–25.

The accident analyses in this SPD EIS are considered to be bounding and address a representative spectrum of possible operational accidents. No major chemical accidents were identified. As discussed in Appendix K.1.1, additional documentation on hazards and accidents would be developed for each facility during the design and construction process.

Appendixes F, G, J, and K describe the methods used to model air-quality-related impacts, provide the emission rates for each facility and alternative, discuss the areas affected, and the treatment of particle deposition. Because the radiological analysis is concerned with the MEI, the initial deposition of radionuclides and its effect on this individual are analyzed. Appendix J was revised to include expected radiological release quantities from each of the proposed surplus plutonium disposition facilities.

The remainder of this comment is addressed in response MD188–25.

MD188-28

Human Health Risk

Detailed agricultural data for each of the candidate sites are presented in the *Health Risk Data for Storage and Disposition of Weapons-Usable Fissile Materials Programmatic Environmental Impact Statement* (HNUS, October 1996). That data report supports this SPD EIS as well as the *Storage and Disposition PEIS*. A separate appendix is not needed to repeat these data verbatim; the data report is available in DOE public reading rooms. The agricultural data in this EIS are used to estimate the doses to the population in 2010. For these projected doses, DOE considers the data from the 1987 Census of Agriculture to be representative of the areas evaluated. These agricultural data are also consistent with those used for dose assessments in the *Storage and Disposition PEIS*.

The remainder of this comment is addressed in response MD188-25.

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COMMENTS ON COSTS ANALYSIS

The cost analysis is really a summary, so it is very difficult to determine how the numbers were

On p 3-3, the comment is made that the cost to transport the plutonium from Pantex can vary from \$10M to \$15 M. At the top of p. 3-4 the statement is made that there would also be an additional cost of \$69M for repackaging if the PD&CF is not located at Pantex, and this cost is charged to the other facilities. Yet, the operating costs that are estimated for Pantex are among the highest of any of the facilities. Why?

On p 3-8, the design and construction costs of the MOX FFF at Pantex are estimated to be: Design and construction - \$510M; Operating Cost -\$610M; Total Cost - \$1,200M. This mistake is repeated throughout the report. These are figures that should be re-analyzed.

In our work with the S&S teams, they emphasized that the most vulnerable link in the disposition system was probably the SST transportation, and that exposing weapons-grade Pu to transportation rather than material that has already been transformed into a substance less attractive as a target for theft and terrorists would be highly desirable. How was that incorporated into the report?

The report does not allow for a more detailed analysis; however, these observations were made even based on this document.

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MD188-29 **Cost Report**

Because this comment relates directly to the cost analysis report, it has been forwarded to the cost analysis team for consideration. The Plutonium Disposition Life-Cycle Costs and Cost-Related Comment Resolution Document (DOE/MD-0013, November 1999), which covers recent life-cycle cost analyses associated with the preferred alternative, is available on the MD Web site at http://www.doe-md.com and in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS and Washington, D.C.

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RUSSIAN ASPECTS OF THE SPDEIS AND THE SITING OF THE PDCF

Timeliness is the key issue. It has been more than 4 years since the NAS declared the surplus plutonium a "clear and present danger." The United States needs to move quickly to maintain forward movement in Russia. Financing is not the only issue in Russia; they will not disposition unless the U.S. does so as well.

The United States should push for the earliest possible demilitarization of pits. I suggest putting U.S./Russian material under IAEA safeguards, thereby creating "political irreversibility." By doing this, it would show the world that we are serious about NPT commitments. Finally, we should separate demilitarization from the disposition technologies which are likely to experience significant delays due to political issues. Placing the PDCF at Pantex provides the quickest route toward demilitarization.

The U.S. would not look favorably on Russians shipping pits unnecessarily; therefore, we should practice what we preach. There is no reason to ship pits from Pantex to SRS when the pits are already housed at Pantex. It just makes sense to site the PDCF at Pantex.

MD188–30 Alternatives

The United States will continue to work with Russia according to agreed-upon paths and timing for surplus plutonium disposition.

Potential transportation impacts of pit disassembly and conversion at Pantex are summarized in Chapter 4 of Volume I and Appendix L. Under any of the proposed alternatives, the risks to the public from the transportation of these materials are small as shown in Table L-6.

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K. L. Peddicord, Ph.D. Associate Vice Chancellor for Strategic Programs Texas A&M University College Station, TX 77843

A key element in the surplus plutonium disposition mission will be provisions to allow for either bilateral inspections or multilateral inspection of excess weapons material. These functions contribute to important U.S. policy issues on transparency and openness relating to the disposition of surplus weapons materials both in the United States and the Russian Federation. Bilateral inspection with Russia will be important to develop a mutual level of confidence with the Russians for the entire disposition effort. Such bilateral inspection agreements will also provide confirmation to the U.S. through our inspection of Russian facilities that their efforts are proceeding accordingly. Likewise, potential multilateral inspection under the auspices of the International Atomic Energy Agency in Vienna, Austria, will give assurances to the global community of U.S. leadership in this key endeavor.

While the inspection function will be an ancillary enterprise, it also will have some environmental impact. Accommodations must be made for the facilities, equipment and individuals performing this role. These requirements can presumably be handled in a straightforward way with minimal environmental disruption.

In terms of the inspection function and its relation to the Pit Disassembly and Conversion Facility (PDCF), the input material to the PDCF will be in forms which are classified. However, the output material will be either converted to a metal "hockey puck" or plutonium oxide powder. Subsequent storage of this material will not be of a classified nature and will be subject to international inspection. It is noted that by locating the PDC Facility at the Pantex Plant, the necessary Perimeter Inspection, Detection and Alarm System (PIDAS) is in place to guarantee the security of weapons grade material. Reconfiguration of the existing areas at Pantex could be done in a straightforward way to allow for the inspection requirements while assuring that classified information and material is not compromised.

A second aspect of the inspection requirements is also worth noting. As mentioned above, it is the material produced by the PDCF which will be subject to inspection. This precludes the possibility, which has been suggested elsewhere, that a fully integrated facility might be used which will have weapons pits as the input and MOX fuel as the output. Such a facility would not allow for the inspection of the product of the pit disassembly and conversion steps. If it were to be proposed at a Russian installation, presumably such a fully integrated approach with restrictions for the inspection of unclassified material would not be acceptable to the United States. We would want to be able to assure that the MOX fuel coming out was the result of the pits going in. As a result, separation of the pit conversion function from the MOX fuel fabrication will be necessary.

The Pantex Plant provides the opportunity for a facility for pit disassembly and conversion which meets, in a straightforward way, the requirements for key bilateral and multilateral inspection while minimizing the number of steps for the handling of sensitive weapons components. The selection of Pantex for the PDC Facility should assure expediency in carrying out U.S. and international nonproliferation goals. Bilateral and IAEA requirements could be more easily facilitated at Pantex thereby implementing pit disassembly and conversion more quickly, entering into an agreement to reach this same result with the Russians, and achieving the critical goal of timeliness which is a key factor in the surplus plutonium disposition mission.

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MD188-31 Nonproliferation

DOE acknowledges the commentor's support for Pantex, and appreciates the input on existing capabilities at the site. Further, DOE agrees that bilateral monitoring with Russia of the classified plutonium material and international inspection of the unclassified material would give assurances to the global community of U.S. leadership in plutonium disposition. Once the United States and Russia complete an agreement providing the basis for exchanging classified nuclear information, the procedures to be used for inspection of pits in storage could potentially be adapted to contribute to bilateral monitoring of the pit conversion facility. International monitoring and inspection of the unclassified plutonium would also allow the United States and Russia to demonstrate to each other and to the international community that disposition was being carried out under stringent nonproliferation controls, and that the excess plutonium was not being diverted for reuse in weapons.

Accommodation for international inspection of the unclassified material was incorporated in the design of the pit conversion facility, as shown in Figure 2–7. The MOX facility would be a separate function and would only process unclassified materials; accommodation for international inspection was incorporated in the design of that facility, as shown in Figure 2–14.

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Richard A. Hartley, Ph.D., P.E. Technical Director Amarillo National Resource Center for Plutonium Amarillo, TX 79101

Because of the public's concern about environment, safety, and health issues associated with Pantex, the Center was asked by the Governor's office to perform an independent safety and health analysis of the plutonium conversion mission and mixed oxide fuel fabrication mission at Pantex. The Center's technical team included:

- Dr. Ian Hamilton, Texas A&M University, certified health physicist
- . Dr. Randy Charbeneau, University of Texas, professional environmental engineer
- Dr. John Sweeten, agricultural professional engineer, Resident Director of the Agricultural Research and Extension Center
- Dr. Bobby Stewart, West Texas A&M University, agricultural scientist
- Dr. Nolan Clark, agricultural professional engineer, Director of the USDA Agricultural Research Service, Bushland Texas
- Dr. Jim Rock, Texas A&M, certified industrial hygienist
- Dr. Paul Vaughn, Texas Tech University, agricultural communications specialist

The results of that independent study were provided to elected officials, Texas regulators, and citizens of Amarillo in November of 1997. The study was conducted by the team named above. The study concluded that the risks associated with the new missions are comparable to the risk of current operations at Pantex and there are no impacts on water resources, water quality, soil or air resources.

We were also asked by the Governor's office to have the university principal investigators review the draft Surplus Plutonium Disposition Environmental Impact Statement. As in the risk characterization effort presented in November, the researchers find that there are no significant environmental or safety impacts associated with the pit disassembly conversion or MOX mission coming to Pantex. These results are presented in the following pages.

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COMPARISON OF RISK CHARACTERIZATION AND SPD EIS

Main points brought out at the Amarillo Public Meetings (August 11, 1998):

- . There are no adverse environmental impacts associated with conversion and hence no environmental discriminators between Pantex and SRS (EIS uses the word "modest differences")
 - We will use the expertise and results from the Risk Characterization to validate DOE's EIS that there are no significant environmental impacts of PDCF at Pantex
- · There is no real cost difference between SRS and Pantex for conversion.
- There is definitely a timeliness, radiological dose and transportation issue if it is decided to move all missions to

1. ANNUAL WATER USAGE

	RISK CHARACTERIZATION (millions of gal./yr.)	EIS
		(millions of gal/yr.)
Carson County Water Usage	37,000	33,200
Current Pantex Operations	220 (0.5%)	163 (0.5%)
	(1994)	(1995)
Pit Conversion (ARIES)	12.7 (0.03%)	12.7 (0.04%)

Risk Characterization p. 3 (slides) EIS Table 4-225 on p. 4-330 & p. 3-113

SUMMARY OF WATER

- · RISK CHARACTERIZATION RESULTS ARE COMPARABLE TO EIS
- OPERATIONALLY, THERE WILL BE NO IMPACT ON WATER RESOURCES

	RISK CHA	RACTERIZATION		EIS
WASTE TYPE	ANNUAL VOLUME (m²)	ANTICIPATED TREATMENT ANIMOR DISPOSAL METHOD (c.g. selidification)	ESTIMATED ADDITIONAL WASTE GENERATED (=*/yr)	TREATMENT AND/OR DISPOSAL METHOD
TRI)	17	Evaporate and/or solidify spont electrolytic decontamination and HEU processing solutions on-site. Disposal of all TRU waste by shipment to WIPP	18	TRU wastes would be treated, packaged, and certified to WIPP waste acceptance criteria. Liquid TRU wastes would be evaporated or solidified before packaging for storage.
Mixed TRU	l i	Disposal of mixed TRU waste by shipment to WIPP	included in TRU	included in TRU
LLW	60,36	Solidify speat electrolytic decontamination and HEU processing solutions on-site: solidify/absorb small quantities of analytical lab waste on site. Off-site disposal	60	LLW would be packaged, certified, and accumulated at the new facilities before being transferred for transment and interim storage at existing conset transfers. Liquid LLW would be evaporated or solidified before being packaged for storage.
Mixed LLW	1.2	Solidifyfabsoch small quantities of analytical lab waste on-site. Off-site treatment and disposal.	<u> </u>	Mixed LLW would be stabilized, packaged, and stored on the site for treatment and disposal in a manner consistent with the site treatment plan for Pantex
Hazardows	R4	Off-site commercial treatment and/or disposal.	2	Hazardous wastes would be packaged for treatment and disposal at offsite permitted commercial facilities.
Nonhazardous Liquid Solid	34,000 520	On-site treatment of sanitary waste. Off- site commercial recycling and/or disposal and follow emment practices on disposal of solid wastes.	25,000 1,800	Nonhuzardous solid waste would be packaged in conformance with standard industrial practice and shipped to ensite and office disposal and recycling, faellities. Nonhazardous wastewater would be treated before being discharged to the Pantes wastewater treatment system.

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Hisk Characterization Table 2.5 on p. 12 (paper) & p. 6 (sildes) EIS Table 4-62 on p. 4-84 & p. H-38 to H-40

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MD188-32 Infrastructure

DOE acknowledges the commentor's conclusion that operationally there would be no impact on water resources at Pantex.

MD188-33 **Waste Management**

DOE acknowledges the commentor's conclusion on waste management

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SUMMARY OF WASTE

- RISK CHARACTERIZATION RESULTS ARE COMPARABLE TO EIS
- ALL WASTES GENERATED FROM THESE PROCESSES CAN BE MANAGED WITH NO ADVERSE EFFECTS
- WASTES FROM THESE PROCESSES WILL BE MINIMAL
- THE SMALL AMOUNT OF LIQUID WASTES WILL BE SOLIDIFIED FOR DISPOSAL
- WASTES WILL BE SHIPPED OFF-SITE FOR FINAL DISPOSAL
- IT IS ASSUMED THAT TRU WASTE WOULD BE STORED ON THE SITE UNTIL 2016, BECAUSE
 CURRENT SCHEDULES FOR SHIPMENT OF TRU WASTE TO WIPP FROM SURPLUS
 PLUTONIUM DISPOSITION FACILITIES WILL BRGIN IN 2016 (EIS P. 4-83)
- 3. BACKGROUND FOR ROUTINE RELEASES TO PROVIDE RELATIVE IMPACT FOR AIR EMISSIONS AND ENVIRONMENTAL IMPACT FROM A HYPOTHETICAL ACCIDENTAL RELEASE

FOR THE AREA OF PANTEX AND AMARILLO

RISK CHARACTERIZ	ATION	EIS		
SOURCE	DOSE (mrent/person)	SOURCE	DOSE (mrem/yr)	
Annual Cosmic Ray Dose	33	Cosmic and External Terrestrial Redigition	93	
Annual Natural Terrestrial Dose	28	Internal Terrestrial Radiation	39	
Annual Natural Radon Exposure	200	Radon in homes (inhaled)	200	
	<u> </u>	Other Background Radiation	65	
Annual Total	261	Total	397	

*Other Background Radiation includes diagnostic x rays and nuclear medicine, weapons test fallout, air travel, and consumer and industria

products

Risk Characterization p 10 (slides), FIS Table 3-32 on p. 3-103

4. AIR EMISSIONS

ROUTINE RELEASES

	RISK CHARACT	CTERIZATION EIS		
MATERIAL	ARIES ANNUAL EMISSIONS (gm)	ARIES EMISSION DOSE (mrem/yr)	INCIDENT FREE OPERATIONS ANNUAL DOSE (mrem)	
Plutonium	1.4 x 10 ⁻⁵	1 x 10-		
Tritium	.1	8 x 10 ⁻²	6.2×10 ⁻²	

RISK CHARACTERIZATION EIS

METHODOLOGY --textd Pantex average sumual meteorological conditions
-chose worst-case downwind location (similar to EIS, MEI)
--Most Effected Individual (MEI)-

Risk Characterization p. 9, 10 (slides). EIS Table J-27 on p. J-24 & p. J-21

IMPACT OF ROUTINE RELEASES

- RISK CHARACTERIZATION RESULTS ARE COMPARABLE TO EIS
- ANY ROUTINE RELEASES WOULD BE ARE 5000 TIMES LOWER THAN BACKGROUND (22% VARIATION IS NOTHING)

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- · OPERATIONALLY, THERE WILL BE NO IMPACT ON AIR RESOURCES
- · OPERATIONALLY, THERE WILL BE NO IMPACT ON SOIL
- OPERATIONALLY, THERE WILL BE NO IMPACT ON WATER QUALITY

MD188–34 Human Health Risk

DOE acknowledges the commentor's conclusion that air emissions would not affect the air, soil, or water quality at Pantex.

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5. ENVIRONMENTAL IMPACT FROM A HYPOTHETICAL ACCIDENTAL RELEASE

	RISK CHARACTERIZATION	EIS
SCENARIO	DOSE	DOSE
	(mrem/yr)	
Acute ingestion of plutonium from surface water	.7	N/A
Acute ingestion of plutonium from groundwater	.4	N/A

	RISK CHARACTERIZATION	EIS
METHODOLOGY	-used worst-cast meteorological conditions to predict amount of material deposited on area of interest used maximum credible amount of material released (190 gm)	used maximum material released (39 gm)
Surface Water Case	-assumed completely mixed with no settling	
	-assumed no water treatment	
	assumed no blending with ground water	N/A
Groundwater Case	-assumed all particulates are washed into the playa	
	-assumed water is consumed from a well drawing water from the Peroked Aquifer directly below the playa	
		N/A

Risk Characterization p 22 (slides), EIS Table K-12 on p. K-38

SUMMARY

- RISK CHARACTERIZATION EXAMPLE WAS PURELY BOUNDING CALCULATION AND NOT TYPICALLY PERFORMED IN THE NEPA PROCESS
- THE EIS SOURCE IS SMALLER THAN THE RISK CHARACTERIZATION SOURCE
- THEREFORE WE WOULD EXPECT EVEN LOWER DOSES

6. IMPACTS ON AGRICULTURE OF A HYPOTHETICAL ACCIDENTAL RELEASE

	RISK CHARACTERIZATION	EIS
PATHWAY	ACRES AFFECTED	
Inhalation of resuspended material	110	N/A (see note)
Ingestion - deposition on fresh fruit	130	N/A
Ingestion - deposition on fresh vegetables	130	N/A
Ingestion - deposition on grain	80	N/A
Ingestion - milk deposition on forage	2	N/A
Ingestion - meat deposition on forage	2	N/A

i.	RISK CHARACTERIZATION	ÉIS
METHODOLOGY	-used maximum credible amount of material released (100 gm)	-used
	-determined acres of land affected to measure agricultural consequence	maximum material
	-used adverse meteorological conditions to compute affected areas	released
	-determined ways that material could enter a person's body (inhalation of dust, ingestion of food, etc.)	(39 gm)
	-identified number of acres where corrective action would be required to reduce public dose below acceptable levels (Protective Action Quidelines limits)	L

SUMMARY

- RISK CHARACTERIZATION WAS PURELY BOUNDING CALCULATIONS AND NOT TYPICALLY PERFORMED IN E18
- THE EIS SOURCE IS SMALLER THAN THE RISK CHARACTERIZATION SOURCE
- HENCE THE AFFECTED AREA FROM A HYPOTEHTICAL ACCIDENT RESULTING IN POTENTIAL RELEASE WOULD BE SMALLER
 - NOTE: EIS, P K-8 PATHWAYS TO GROUND AND SURFACE WATER INCLUDING RESUSPENSION AND INHALATION OF PLUTONIUM AND INGESTIONS OF CONTAMINATED CROPS WERE STUDIED AND FOUND NOT TO CONTRIBUTE AS SIGNIFICANTLY AS DOSE TO INHALATION

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MD188-35 **Human Health Risk**

DOE acknowledges the commentor's conclusion that doses that would be expected from an accident at Pantex are even lower than those presented in this SPD EIS.

MD188-36 **Human Health Risk**

DOE acknowledges the commentor's conclusion that the affected area from an accident analyzed in this SPD EIS would be smaller than that presented in the commentor's impact analysis because he was using a higher source term.

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7. POTENTIAL IMPACTS DUE TO HYPOTHETICAL ACCIDENTS

	RISK CHARAG	CTERIZATION			EIS		
ACCIDENT	PROBABILITY (y1 -1)	MATERIAL RELEASED (g)	POTENTIAL CANCERS PER YEAR OF FACILITY OPERATION	ACCIDENT	FREQUENCY ^b (per year)	SOURCE TERM (g)	LATENT CANCER FATALITIES PER YEAR® WITHIN 80 km
Dock Fire	5.0 x 10 ⁻⁴	9	1.8 x 10 ⁻⁵				
Criticality	1.6 x 10 ⁻⁴		3.8 x 10 ⁻¹⁰	Criticality	Extremely unlikely 10 ⁻⁴ to 10 ⁻⁶	1.0 x 10 ¹³ Fissions	1.4 X 10-9
Deflagration	1.0 × 10 ⁻⁴	4.8 x 10 ⁴	3.9 x 10 ⁻¹¹	Explosion	Unlikely 10 ⁻¹ to 10 ⁻⁴	3.2 x 10°	2.4 x 10 ⁻⁸
Cell Fire	1.0 x 19 ⁻⁴	9.8 x 10 ⁻⁴	1.9 x 10 ⁻¹²	Fire	Unlikely 10° to 10°	1.2 x 10 ⁻⁵	9.1 X 10 ⁻¹¹
Oxy. Explosion	5.0 x 10 ⁻⁵	65	1.3 x 10°	N/A	N/A	N/A	N/A
Spill	4.5 x 10 ⁻³	88 x 10°	i.6 x 10 ⁻¹³	Leaks/spills of nuclear material	Extremely unlikely 10 ⁻⁴ to 10 ⁻⁶	4.4 x 10 ⁻⁶	3.3 X 10 ⁻¹³
Max. Earthquake	1.5 x 10 ⁻⁵	100	6.0 x 10*	Heyond- design-basis ⁴ carthquake	Extremely unlikely to beyond extremely unlikely 10 ⁻⁴ to 10 ⁻⁶ to less than 10 ⁻⁶	3.9 x 10 ¹	3.2 X 10 ⁴
Truck Fire	3.2 x 10 ⁶	30	3.8 x 10-7	N/A	N/A	N/A	N/A
			NOT C	REDIBLE			
Max. Cell Fire	2.0 x 10 ⁷	N/A	N/A	Beyond- design-basis fire	Beyond extremely unlikely less than 10 ⁻⁶	1.7 x 10 ⁻²	1.4 X 10 ⁻¹⁰
A/C into Oxide Storage Facility	80 x 10 ³	N/A	N/A				
A/C into DCF	4.7 x 10 ⁻⁸	N/A	N/A	Aircraft crash	Beyond extremely unlikely less than 10-6	2.2 x 10'	1.8 X 10-7

Risk Characterization p. 13, p. 14, p. 16 (slides), EIS Table K-12 on p. K-38

CURRENT PANTEX OPERATIONS

ACCIDENT TYPE	POTENTIAL CANCERS PER YEAR OF FACULITY OPERATION
HE Initiated Pu Dispersal - Nat. Event	7.2 x 10 ⁻⁴
HE Initiated Pu Dispersal - Int. Event	6.3 x 10 ⁴
Fire Driven Pu Release - Nat. Event	2.9 x 10°
Pu Release - A/C or Seismic	6.8 x 10 ^{-k}
Pit Breach - Int. Event	1.5 x 10*

Risk Characterization p. 17 (slides) RISK SUMMARY

OUR RESEARCH SHOWS THAT THE POTENTIAL SOCIETAL RISKS ASSOCIATED WITH THE PROPOSED NEW MISSIONS WILL BE COMPARABLE TO THAT FROM CURRENT ACTIVITIES.

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Facility Accidents

DOE acknowledges the commentor's conclusion that the societal risks posed by the proposed plutonium disposition facilities would be comparable to those associated with Pantex's current activities.

^{*}The societal risk in potential cancers per year of facility operation is the probability of occurrence of the event that leads to a health effect (in units of yer) auditplied by the health effect consequence per event (e.g., fatal cancers per accident event) (Risk Characterization p. 11 of Pretiminary)
*The frequency listed for each accident category represents the estimated overall annual probability of occurrence for that type of accident. (EIS

^{*}The frequency listed for each activate category represents are estimated overal annual prosaming to occurrence on unarryse of account (e.g., 4-40).

*Rak is usually defined as the practical of the consequences (in terms does e.g., person-rem or health effects e.g., latent cancer falialities) and estimated frequency of a given accident (per year). (EIS. p. K-1).

*Design basis for Performance Caregory 2 pulcorium facility - designed to withstand the 1/10,000 year earthquake with the performance good that occupant safety, entimed operations, and hazard confinement being assured.

*Beyond design basis - partial or total collapse of situations, spills, possibles fires, and less of confinement of plutonium powder (p. K-5).

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David L. Barnes, Ph.D., P.E. Environmental Program Manager Amarillo National Resource Center for Plutonium Amarillo, TX 79101

The total amount of space that would be required for storage of TRU waste resulting from operations of the planned facility at Pantex is around 2800ft2, or an area that is equivalent to a modest size residential home. According to the DOE, this required space would be added onto the conversion facility and would constitute only 1.5% of the total space required for the planned facility. The total amount of space required to store LLW before shipment is about 0.25 acres, or 8% of the planned Hazardous Waste Treatment and Processing Facility. I am assuming that the DOE plans on constructing this WM facility are unrelated to the sitting decision (Reference to the WMPEIS). By my interpretation as an engineer, I do not believe that the facilities required to store this waste before shipment is significant compared to the overall magnitude of the project. By DOE's admission within the Surplus Plutonium Disposition Draft EIS, they do not believe that the waste generated from this facility is significant, or in DOE's own words "..impacts of the management of TRU waste at Pantex should not be major," and "Impacts of the storage of additional quantities of LLW at Pantex should not be major." Therefore, one can conclude that the required waste management should not be used as a discriminator in the sitting of a conversion facility.

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Waste Management

DOE agrees that impacts from the management of waste generated by surplus plutonium disposition activities would not be major, although costs may be higher at Pantex than at some of the other DOE sites due to the lack of an existing TRU waste management infrastructure. The construction of the Hazardous Waste Treatment and Processing Facility is independent of the decision on the siting of facilities for surplus plutonium disposition.

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Carl A. Beard, Ph.D. Nuclear Program Manager Amarillo National Resource Center for Plutonium Amarillo, TX 79101

DOE gives 3 reasons for selecting SRS for MOX:

- · Activity complements existing missions.
- · Takes advantage of existing infrastructure.
 - "Pantex does not offer a comparable infrastructure, including waste treatment."
- · Staff expertise.

No supporting information is given to support conclusion #1. What existing missions are complemented? None seem obvious. There is no ongoing dry plutonium processing at SRS.

No supporting information is given to support conclusion #3:

- Has SRS ever done MOX fuel fabrication?
- · Has SRS ever fabricated standard ceramic reactor fuel?
- · Is SRS currently fabricating any reactor fuel?
- · Is SRS doing any dry Pu processing?
- · What expertise are we talking about?

If we examine #2 more closely, we find out that the Pantex site does not require any additional construction over SRS for the MOX facility (this can be determined by looking at the wastes produced during construction and the employment required during construction which are identical for MOX for SRS and Pantex), so what infrastructure is being taken advantage of that isn't at Pantex? Also, the document repeatedly states that the wastes should "not have a major impact" at Pantex, so what waste treatment facilities are Pantex lacking? In fact, in the section on cumulative results at SRS (summary page S-30, the "cumulative waste volume for hazardous waste exceeds the treatment and storage capacity" and the "treatment capacity for LLW could be exceeded." Also, projected water requirements will exceed current site capacity if APT is built. So if anything, SRS should be at a disadvantage. Also, no analysis was done on the environmental effects of expanding the water capacity.

If conversion is not done at Pantex, all the pits will have to be repackaged in AT400 (or some other approved transportation container) and shipped to SRS. This will not have to be done if the facilities are located Pantex. The EIS estimates a 40% dose reduction to Pantex workers due to this. Were ALARA considerations evaluated as part of the decision process?

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MD188–39 Alternatives

Complementary missions that are ongoing at SRS include plutonium storage, nuclear materials stabilization, waste management, and research and development.

Existing infrastructure includes DWPF; waste management facilities such as the TRU waste certification facility, Consolidated Incineration Facility, and LLW disposal facilities; and safeguards and security systems. DOE is presently considering a replacement process for the in-tank precipitation (ITP) process at SRS. The ITP process was intended to separate soluble high-activity radionuclides (i.e., cesium, strontium, uranium, and plutonium) from liquid HLW before vitrifying the high-activity fraction of the waste in DWPF. The ITP process as presently configured cannot achieve production goals and safety requirements for processing HLW. Three alternative processes are being evaluated by DOE: ion exchange, small tank precipitation, and direct grout. DOE's preferred immobilization technology (can-in-canister) and immobilization site (SRS) are dependent upon DWPF providing vitrified HLW with sufficient radioactivity. DOE is confident that the technical solution will be available at SRS by using radioactive cesium from the ion exchange or small tank precipitation process. A supplemental EIS (DOE/EIS-0082-S) on the operation of DWPF and associated ITP alternatives is being prepared. Although the SRS staff may not have training in dry plutonium processing, they are trained in plutonium processing. In addition, reactor fuel fabrication was conducted in M-Area at SRS in support of production reactor operation, which ceased in 1992.

MD188–40 Waste Management

There would be advantages to siting the proposed surplus plutonium disposition facilities at sites with active plutonium facilities, or to collocating two or more surplus plutonium disposition program facilities at a site. As described in Section 2.3.1, some infrastructure such as that associated with safeguards and security could be shared. Although DOE recognizes that some savings could be realized by collocating facilities, this SPD EIS includes a conservative analysis that generally does not account for these advantages. Section S.6 of the *Summary* states that because TRU waste is

not routinely generated and stored at Pantex, TRU waste storage space would be designated within the proposed surplus plutonium disposition facilities. Storage within the proposed facilities would only be required at Pantex because the other DOE sites have existing onsite TRU waste storage facilities. Section S.7 of the Summary states that although the cumulative volume of hazardous waste would exceed the treatment and storage capacity at SRS, major impacts on the waste management infrastructure would be unlikely because hazardous waste is generally not held in long-term storage, but rather is treated and disposed of at both onsite and offsite facilities. This section also states that although treatment capacity for LLW could be exceeded at SRS, major impacts would be unlikely because most LLW could be disposed of without treatment. The source of water for the accelerator, if built, would have been the Savannah River and it would not have affected the ability of the site to supply water to the proposed plutonium disposition facilities. The cumulative impacts section, Section 4.32, has been changed accordingly. The tritium production ROD that was issued in May 1999 chose the commercial light water reactors for tritium production.

MD188-41 Transportation

ALARA considerations were used by the engineering, technical, and safety and health personnel who prepared the source information upon which the environmental impacts in this SPD EIS were determined. ALARA considerations would continue to be applied during the detailed design, construction, operation, and eventual D&D of the proposed surplus plutonium disposition facilities. DOE acknowledges that any decision to locate the pit conversion facility at a site other than Pantex would result in additional repackaging for shipment, and thus, increased dose to workers at Pantex. Section 2.18 and Appendix L.5.1 were revised to discuss repackaging the pits.

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THE SPD EIS TREATMENT OF PROLIFERATION CONCERNS DUE TO TRANSPORTATION

- It appears that the majority of the shipments that involve significant volumes of material, and significant proliferation concern (as defined by an indication, in Table S-3 on p. S-20, to use SSTs) would occur as follows:
- Campaign 1: 17 metric tons (t) of surplus nonpit Pu, from various DOE sites to the conversion immobilization facility.
- Campaign 2: 33 t of surplus pits and clean metal from Pantex to the pit disassembly/conversion facility.³
- Campaign 3: 33 t of weapons-grade Pu, in the form of PuO₂ from the pit disassembly/conversion facility to the immobilization or MOX facilities.
- Campaign 4: 33 t of weapons-grade Pu, in MOX fuel bundles, from the MOX facility to a
 domestic commercial nuclear reactor.
- The second of the "equally weighted screening criteria" (p. S-13) "used to reduce the large number of possible facility and site combinations to the range of reasonable alternatives" (p. S-13) is entitled "proliferation concerns due to transportation of materials." It is applied in such a way that any alternative that involves all of campaigns 2, 3 and 4 is eliminated from further consideration. But NEPA requires that "all reasonable alternatives be considered." Therefore, in effect the application of this criterion puts the DOE on record as believing that proliferation concerns associated with transportation of these materials are so great that a reduction of 33! in the total amount of weapons-grade Pu to be shipped is sufficient to deem an otherwise reasonable alternative as unreasonable.
- But there are alternatives that would provide an even further reduction in the amount to be chinged:
 - If all three facilities were located at Pantex, then only Campaign 1 (17 t) would be necessary. This is a 33 t reduction from the 50 t otherwise required under any other immobilization only option.
 - If a hybrid option were deemed essential for other reasons (e.g., achieving an agreement
 with the Russians), then collocating the pit conversion and MOX facilities at Pantex would
 require only Campaigns 1 and 4, which is a 33 t reduction in the amount to be shipped
 under any other hybrid option.

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MD188-42 Transportation

DOE acknowledges the commentor's preference for Alternatives 9 or 10, which involve collocating pit conversion and MOX facilities at Pantex. The location of the immobilization facility was considered in the *Storage and Disposition PEIS*, and the ROD states DOE's strategy to immobilize at either Hanford or SRS. Therefore, this SPD EIS does not analyze immobilization at Pantex. Table L–6 shows the total transportation risks for all alternatives, including Alternatives 9 and 10. The transportation impacts for the preferred alternative, Alternative 3, are similar to Alternatives 9 and 10.

³ This assumes all surplus pits and clean metal selected for disposition already are stored at Pantex. On p. S-4 it is stipulated that "most of the surplus pits are currently located there" (i.e., at Pantex).

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Summary: If proliferation concerns associated with shipment of these materials is so
great that a reduction of 33 in the amount to be shipped is sufficient to cause an
otherwise reasonable alternative to be deemed unreasonable, then why is there no
record that those alternatives leading to similar further reductions were given
commensurate credit?

• The following bar charts are an effort to present this graphically. DOE deems the shipping reductions in going from the left bars to the middle hars as sufficient to make alternatives requiring the maximum shipment unreasonable, on the basis of the associated proliferation risk. But there is no evidence I can find that they value the equivalent further reduction in going from the middle to the right bars - which just happen to favor Pantex - as worth a tinkers damn.

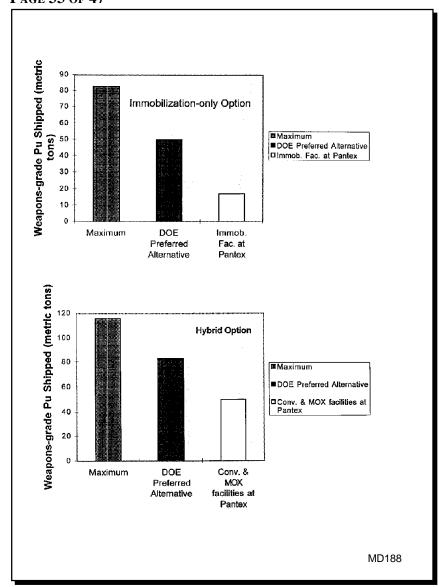
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Draft Environmental Impact Statement
Comments

Comments

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Surplus Plutonium Disposition

Processing and handling of unincorporated weapons-grade plutonium represents a clear departure from the historical radiological assembly/disassembly operations conducted at Pantex Plant. Given the restrictions of law and existing regulations, the Texas Department of Health has actively maintained limited surveillance of the Pantex Plant boundary and at readily accessible pre-selected monitoring points on site. Although by no means considered to be optimum, and given the nature of operations involving only handling of pre-fabricated radioactive components, this surveillance was considered to be the best achievable under the circumstances. To date, no significant off-site radiological degradation of the environment has been detected.

Any change in the nature of the mission or operations at the Pantex Plant must be undertaken with utmost sensitivity to needs of the neighboring community in addition to maximum attention to full compliance with published standards for protection against radiation. Texans must be assured the public health, the public safety, and the surrounding environment will be adequately protected.

While full Nuclear Regulatory Commission licensing of the Mixed-Oxide Fuel Fabrication Facility should be aggressively pursued, external regulatory oversight of the Plutonium Pit Conversion Process is not possible under existing law, nor is legislation to empower external regulation of Department of Energy Special Nuclear Materials operations likely to occur in the foresceable future. There is, however, a discrete step in the pit conversion process, when Special Nuclear Material is removed from the pit shell and changed from its classified shape, that the Department of Energy should explore as a candidate for external oversight. This step in the process roughly coincides with the point of potential workplace and environmental radiological contaminant generation. The succeeding steps in the process should not by nature be precluded from external review. Cooperative activities undertaken by the Department of Energy over the past decade serve to indicate that independent external oversight can occur within national security constraints. The activities of the Defense Nuclear Facility Safety Board, Environmental Protection Agency, Occupational Safety and Health Administration, and of states hosting Department of Energy Facilities have produced some measure of compliance with accepted industry practice and published regulatory standards. Independent external oversight is clearly feasible, and would be in the best interest of the Department of Energy, the State of Texas, and the Nation Should the Department of Energy decide to site the Mixed Oxide Fuel fabrication facility, the Pit Disassembly and Conversion Facility, or both facilities at Pantex Plant, active state participation in the review of facility

MD188–43 DOE Policy

DOE acknowledges the commentor's environmental and health-related concerns. This SPD EIS was prepared to provide a comprehensive description of proposed actions and alternatives and their potential environmental impacts. DOE believes that all activities that are part of the proposed action and alternatives are analyzed adequately in this EIS. Each of the proposed surplus plutonium disposition facilities would be subject to some form of independent oversight. The pit conversion and immobilization facilities would likely be subject to review by DNFSB, and the MOX facility would be under the purview of NRC. As discussed in Section 2.4, it is likely that the United States would voluntarily offer to have the proposed facilities placed under international safeguards. However, the process of implementing international safeguards is not as yet fully defined. That process is part of ongoing sensitive negotiations between the United States and Russia.

As discussed in Chapter 5, DOE (or DCS) would have to obtain new or modified applicable State or Federal permits or licenses for construction and operation.

Based on the decisions made in the SPD EIS ROD, site emergency management programs would be modified to consider new accidents not in the current program. Similarly, as discussed in Appendix L.3.2, the Transportation Safeguards Division has established emergency plans and procedures that would be invoked whenever special nuclear materials are being shipped.

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design would be imperative. Lessons learned from past Department of Energy activities at other locations should be applied to operations proposals. Best available technology should be utilized in the construction of the facility to ensure containment and control of potential radioactive contaminants. Subsequent state routine monitoring of process controls, such as task local exhaust verifiation, physical containment features and comminant control procedures associated with the process would be necessary. Adequate resources would be required for the state to assemble and support a team of professionals dedicated to the routine surveillance of the new facilities.

An assessment of additional radiological impacts resulting from the proposed Pantex Plant expansion must receive priority consideration. The assessment would serve as the basis for further emergency planning efforts. Of particular interest would be issues relating to safe handling and transportation of the Special Nuclear Materials prior to processing, product resulting from processing and the wastes generated during the associated operations. Continued Department of Energy commitment to the upgrade of local emergency planning and response capabilities would be required.

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Scrupulous management of Pantex Plant is crucial to the future of the Texas Panhandle, not only in postulated near term socioeconomic benefits, but also in fulfilling responsible stewardship of regional tear term socioeconomic benefits, but also in fulfilling responsible stewardship of regional environmental resources. The decisions made in the Surplus Plutonium Disposition process must be made giving due consideration to the needs of the local citizens, the State of Texas as well as the Nation. Murtuning the existing positive relationship and further expanding the cooperative arrangements between the Department of Energy and the State of Texas to address these issues is in the best interest of all.

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United States Department of Energy Office of Fissile Materials Disposition

July 1998

Texas Natural Resource Conservation Commission Comments

Plutonium disposition includes three (3) processes: pit conversion, immobilization, and MOX fuel fabrication. Four (4) candidate sites are considered for plutonium disposition in the EIS, including Hanford, INFEL, Pantex, and SRS. Pantex is the preferred site for pit conversion. SRS is the preferred site for immobilization and MOX fuel fabrication. The following comments are predicated on the assumption that immobilization and MOX fuel fabrication will indeed occur at a location other than Pantex, in accordance with the preferred alternatives outlined in Sections 1.6 and 2.4.2.1 of the EIS.

- The volume of hazardous wastes is not included in Table 2-4. Summary of Impacts of Construction and Operation of Surplus Plutonium Disposition Facilities by Alternative and Site.
- . A typographic error occurs on page 3-110; TWRCC should be TNRCC. Another typographic error occurs in Section 3.4.7.2.1, page 3-114; Texas Development Board should be the Texas Water Development Board.
- 3. Drinking water should be examined as a possible route of exposure for radiological impacts.
- 4. We concur with DOE's appraisal that the Pantex Plant Federal Facility Compliance Act Compliance Plan/Agreed Order (FFCA) will have to be modified to accommodate the new TRU and LLW mixed waste streams. The Hazardous Waste Permit will also have to be modified to accommodate the new hazardous waste streams. Please clarify whether wastes generated during decontamination of the disposition facilities will be considered new waste streams. We assume that DOE will provide a detailed lists of waste components when the modifications are submitted to the TNRCC for approval. We recommend that DOE not commingle TRU and LLW wastes with their corresponding mixed waste streams.
- 5. The EIS states that the plutonium polishing process will either be attached to the plutonium conversion process or the MOX fuel fabrication process (Appendix N, page N-1). We prefer that DOE collocate the aqueous plutonium polishing process with the MOX fuel fabrication facilities. We understand that MOX fuel fabrication will occur at SRS, rather than at Pantex.

MD188

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MD188-44

Waste Management

Table 2-4 was revised to include hazardous waste volumes for each of the alternatives.

MD188-45 General SPD EIS and NEPA Process

DOE acknowledges and appreciates the feedback on typographical errors in the SPD Draft EIS. The errors cited have been corrected.

MD188-46 Human Health Risk

If the proposed surplus plutonium disposition facilities were located at Pantex, a very small incremental annual dose to the surrounding public from normal operations would result via radiological emission deposition on agricultural products (i.e., food ingestion pathway). This dose (about 0.56 person-rem/yr) would be 0.0006 percent of the dose that would be incurred annually from natural background radiation. There would be no discernible contamination of aquatic biota (fish) or drinking water, either from the deposition of minute quantities of airborne contaminants into small water bodies or from potential wastewater releases. Therefore, it is estimated that no measurable component of the public dose would be attributable to liquid pathways.

MD188-47 Waste Management

Neither the SPD Draft EIS nor this SPD EIS states that the Pantex FFCA Agreement Compliance Plan/Agreed Order would have to be modified to accommodate new TRU waste and mixed LLW. Although wastes would be managed in accordance with applicable laws, regulations, agreements, DOE orders, and permits, it is premature at this time to determine whether the FFCA Agreement Compliance Plan/Agreed Order would have to be modified.

D&D is discussed in Section 4.31. DOE will evaluate options for D&D or reuse of the proposed facilities at the end of the surplus plutonium disposition program. At that time, DOE will perform engineering evaluations, environmental studies, and further NEPA review to assess the consequences of different courses of action, including projected waste generation quantities.

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DOE continues to work hard to minimize the generation of mixed wastes, and therefore will segregate the LLW and TRU waste from LLW and mixed TRU waste generated by the proposed facilities when feasible.

MD188-48 Plutonium Polishing and Aqueous Processing

DOE acknowledges the commentor's support for collocating the plutonium-polishing facility with the MOX facility at SRS. On the basis of public comments received on the SPD Draft EIS, and the analysis performed as part of the MOX procurement, DOE has included plutonium polishing as a component of the MOX facility to ensure adequate impurity removal from the plutonium dioxide. Appendix N was deleted from the SPD Final EIS, and the impacts discussed therein were added to the impacts sections presented for the MOX facility in Chapter 4 of Volume I. Section 2.18.3 was also revised to include the impacts associated with plutonium polishing.

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6.	If would be helpful if the EIS consistently acknowledged that TRU waste also includes mixed (hazardous) TRU waste. The mixed TRU waste component is often referred to as a footnote (e.g., the tables in Chapter 4) or not acknowledged at all (e.g., Appendix N). In contrast, mixed LLW is consistently presented as a separate waste category.	4
7.	Please specify what wastes will be generated during pit bisection process (Section 2.4.1.2) and how DOE anticipates these wastes will be managed, e.g., recycled, treated and stored, etc.	5
8.	Shipping routes to Pantex and from Pantex to SRS should be incorporated into the EIS unless this is considered a security issue and random routes will be used.	5
9.	The risk characterization states that the Advanced Recovery and Integrated Extraction System(ARIES) facility will be licensed by the Department of Energy(DOE) and overseen by the Defense Nuclear Facilities Safety Board(DNFSB). Define what is meant by "overseen".	5
8.	Have considerations been made for ongoing radiologic public health surveillance and environmental assessments throughout the life of the project?	5
10.	On page J-23, volume II of the SPD draft EIS, a calculational assumption was made stating that "ground surfaces, at Pantex, were assumed to have no previous deposition of radionuclides". Since data from ongoing projects at Pantex indicate that there has been previous deposition of radionuclides (e.g. survey data from Firing Site 5 residing in the Radioactive Material Licensing Section), please explain how that assumption was made. Will this have any effect on the modeling results for exposures to members of the public?	5
11.	Page S-35 of the SPD EIS summary states that the number of latent cancer fatalities in the general population from Pantex site operations would be expected to increase from 5.5x10E-5 to 3x10E-3 if the proposed SPD facilities were located there. Clarify this large increase in the number of fatal cancers due to SPD facility operations.	5
12.	There is no indication that the non-radioactive or hazardous air quality impacts will be significantly different from the current operation at Pantex. Hazardous air pollutant emissions from pit disassembly and conversion process and/or from mixed oxide fabrication process will be minimal. Sources of potential air quality impacts will include emissions from fruel- burning construction equipment, soil disturbance by construction equipment and other vehicles, the operation of a concrete batch plant, trucks moving materials and wastes, and employee vehicles. According to the EIS, air quality impacts during construction would be mitigated by applying, as appropriate, standard dust control practices such as watering or sweeping of roads and watering of exposed areas. This will control the potential increase in the PMIO emissions due to construction activities.	5

MD188-49

Waste Management

Appendix H was revised to clarify that TRU waste includes mixed TRU waste.

MD188-50 Waste Management

Information on waste generated by specific pit disassembly and conversion processes is summarized in Appendix H and is available in detail in the supporting data reports, such as the *Pit Disassembly and Conversion Facility, Environmental Impact Statement Data Report—Hanford* (LA-UR-97-2907, June 1998). These supporting reports state that LLW and TRU waste would be generated by the pit bisection process. These wastes would be managed along with the other LLW and TRU waste as described in the Waste Management sections of Chapter 4 of Volume I and Appendix H. Supporting reports are available in the public reading rooms at the following locations: Hanford, INEEL, Pantex, SRS, and Washington, D.C.

MD188-51 Transportation

The shipment of nuclear material (e.g., depleted uranium) using commercial carriers would be the subject of detailed transportation plans in which routes and specific processing locations would be discussed. These plans are coordinated with State, tribal, and local officials. The shipment of waste would be in accordance with the decisions reached on the Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste (DOE/EIS-0200-F, May 1997) and the WIPP Disposal Phase Final Supplemental EIS (DOE/EIS-0026-S-2, September 1997). The transportation of special nuclear materials is the subject of detailed planning with DOE's Transportation Safeguards Division. The dates and times that specific transportation routes would be used for special nuclear materials are classified information; however, the number of shipments that would be required, by location, has been included in this SPD EIS. Additional details are provided in Fissile Materials Disposition Program SST/SGT Transportation Estimation (SAND98-8244, June 1998), which is available on the MD Web site at http://www.doe-md.com.

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MD188–52 DOE Policy

In this SPD EIS, the ARIES facility is referred to as the pit conversion facility. It is not correct to state that the pit conversion facility would be licensed by DOE because DOE does not issue licenses. However, DOE would be responsible for the safe operation of this facility. Before the proposed facility could begin operations, a safety analysis report would have to be prepared and an operational readiness review would likely be conducted; this is similar to the NRC licensing process. DNFSB would then periodically review DOE operations and report to the U.S. Congress and the Secretary of Energy on the safety of these operations. In this way, DNFSB oversees DOE operations at nuclear facilities.

MD188–53 DOE Policy

Each year DOE prepares a separate environmental report for each site with significant environmental activities. Each report provides a comprehensive summary of the site's environmental program activities. The sites for which annual reports are prepared include all those evaluated in this SPD EIS. Included in each report are discussions of the site's radiological surveillance programs and the results of environmental assessments. These reports, which are distributed to relevant external regulatory agencies and other interested organizations or individuals, would continue to be prepared throughout the life of the surplus plutonium disposition program. In addition to these annual assessments, health effects studies would continue to be conducted to evaluate the health of the public in the vicinity of the sites, and of workers at the sites. These studies are discussed in Chapter 3 (Volume I) of this EIS and in Appendix M of the *Storage and Disposition PEIS*. It is anticipated that these health studies would also continue throughout the life of the program.

MD188-54 Human Health Risk

The calculations in this SPD EIS were performed to assess the doses from operating the proposed surplus plutonium disposition facilities. The presence on the ground of previously deposited radionuclides does not affect the doses specifically associated with operating the proposed facilities. Doses from existing ground contamination are included in the

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- Since no increase in the hazardous air pollutant emissions are expected from the pit disassembly and conversion process and/or from mixed oxide fuel fabrication activity, none of the alternatives proposed for Pantex in the surplus plutonium disposition EIS would create a significant change in the non-radioactive air quality at Pantex. TNRCC would revisit the proposed impacts of facility operations and emissions and conduct a detailed technical review should DOE submit a permit application for a plutonium disposition facility.
- In general, the predicted non-radiological air emissions at Pantex , which are proposed in the PuEIS, are not expected to differ significantly from existing operations at the facility. However, there are several issues which need to be addressed in the Final PuEIS. The draft PuEIS provides predicted short-term(1-hour or 24-hour average) maximum concentrations for "Hazardous and Other Toxic Compounds." While concentrations are predicted to be less than the 1-hour Effects Screening Levels (ESLs), the predicted 24-hour concentration are estimated to exceed the 24-hour ESLs for benzene and hydrogen chloride. While these exceedances of short-term ESLs are not expected to result in adverse effects, information was not available regarding annual (long-term) predicted concentrations. While the short-term ESLs for benzene and hydrogen chloride were established to protect the general public from acute adverse effects, it is also necessary to evaluate the annual predicted impacts for these compounds. For compounds such as benzene, a known human carcinogen, it is important to evaluate predicted impacts with respect to long-term or annual exposures. For hydrogen chloride, the annual ESI, was derived to prevent corrosion of protect. For compounds such as these and depending on the specific circumstances, the technical review may focus largely on long-term exposure.

Pantex site doses reported in Section 3.4.4. The total doses from existing contamination and from operating the proposed facilities are reflected in the cumulative doses given in Section 4.32.

MD188-55 **Human Health Risk**

The increase in the number of LCFs from 10 years of operating the proposed surplus plutonium disposition facilities at Pantex is the difference in the two numbers cited by the commentor, i.e., 0.003 minus 0.000055, which equals about 0.00295. This amounts to an increase of about 1 chance in 340 of an LCF in the total population within 80 km (50 mi) from 10 years of operation.

Surplus Plutonium Disposition Final Environmental Impact Statement

MD188-56 Air Quality and Noise

For the purpose of this SPD EIS, toxic air pollutant concentrations were compared with the Texas effects screening levels which are based on short-term (1-hr) and long-term concentrations. The concentrations compared with the long-term effects screening levels in the SPD Draft EIS were 24-hr values. The concentrations compared with the long-term effects screening levels were changed to an annual average value, which is consistent with current TNRCC guidance. The exposure to benzene is analyzed in the Human Health Risk sections of Chapter 4 of Volume I for each of the hybrid alternatives (e.g., see Section 4.3.1.4). No emissions of hydrogen chloride to the atmosphere are expected from construction and operation of the pit conversion or MOX facility.

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Review of Surplus Plutonium Disposition Draft Environmental Impact Statement

My review focused on the site description and on alternative 9A.

Section 3.4.2.6 Nonhazardous Waste
 Page 3-96, paragraph 3, lines 3-4, "A proposed upgrade to the sanitary wastewater
 treatment system would ensure that effluent limitations are met."

The DEIS should address whether the proposed upgrade will in fact tack place, or the odds that it will not take place, the likelihood that effluent limitations will not be met if the upgrade does not take place or has a delayed schedule, and the impact on water quality if the *proposed* upgrade does not take place or has a delayed schedule. Table on page 4-219 implies that discharge will increase by about 10 percent; is this correct? Is the upgrade for ensuring compliance with existing discharge or with the 10 percent increase in discharge? Why is the upgrade needed if the wastewater treatment plant is only operating at 35 to 50 percent of capacity, and only expects an increase of 5 percent (page 4-221)?

The text should identify the number and frequency of occurrences when the discharge permits are exceeded under the present operations.

The pathway for contaminant migration through Playa 1 to the perched ground water has in the past been a critical one for ground water contamination at the site so the DEIS needs to thoroughly address implications such as the one raised in the preceding comment.

Section 3.4.6.1 General Site Description
Page 3-108, paragraph 3, lines 1-2, "The Ogallala Formation of Tertiary age consists of
fluvial sands and gravels as well as eolian sands and silts."

The designation of the Ogallala as fluvial and eolian is a little simple and overlooks extensive geologic studies done in support of Pantex Plant operations (e.g., Gustavson, T. C., 1996, Bureau of Economic Geology Report of Investigations No. 239). Gustavson (1996) stated that the Ogallala includes basal fluvial facies and that paleovalley-fill facies of heterogeneous gravel and sand channel deposits and sand and clay overbank deposits are interbedded with eolian sediments.

Section 3.4.6.1 General Site Description
Page 3-110, paragraph 1 on playa hydrology
Text on lines 2-3 overlook the fact that the playas can be dry because infiltration rate
exceeds water inflow rate and thus perpetuates the myth that playa basins are evaporation
ponds.

4. Section 3.4.6.1 General Site Description
Page 3-110, paragraph 2 on Playa 1 water inflow
Text states inflow of 946,000 L/day, which is equivalent to ~345,000 cubic meters per year (CMY). This is only 72 percent of the 473,000 CMY cited in table 3-28 as generation rate of nonhazardous liquid waste. What is the difference between these numbers? Is 128,000 CMY of liquid waste discharge elsewhere than Playa 1 (Text on page 3-96, paragraph 3, states sewage and industrial wastewater are discharged only to Playa 1)?

MD188

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MD188–57 Waste Management

The Pantex Wastewater Treatment Facility upgrades described in Chapter 3 of Volume I would occur regardless of the proposed discharges from the proposed surplus plutonium disposition facilities. These upgrades are needed due to the age of the facilities, changing regulations, and problems with compliance, and are not related to the capacity of the facility. An EA, Final Environmental Assessment for Wastewater Treatment Capability Upgrade, Project No. 96-D-122 (DOE/EA-1190, April 1999), for the treatment plant upgrade was completed in April 1999. If necessary, wastewaters would undergo treatment within the proposed facilities to meet influent requirements of the Wastewater Treatment Facility. Section 3.4.2.6 was revised to update the status of the treatment facility upgrade. As described in the EA, the upgraded and expanded facility would no longer discharge effluent to Playa 1. Instead, effluents would be stored and used to irrigate crops grown on the site in cooperation with the Texas Tech University Research Farm. The waste management impacts table in Section 4.17.2.2 indicates that the 51,000 m³/yr (66,708 yd³/yr) of liquid nonhazardous waste generation would be 5 percent of the existing capacity of the Wastewater Treatment Facility. This additional wastewater would increase the 473,125 m³/yr (618,848 yd³/yr) of current discharges to the Wastewater Treatment Facility by approximately 11 percent. Section 3.4.7.1.1 describes the December 2, 1997, Administrative Order issued by EPA regarding the Pantex Plant NPDES Permit. This section notes that a comprehensive corrective action plan was developed. Corrective actions include upgrade of the Wastewater Treatment Facility, soil stabilization and erosion control, and operational, maintenance, and monitoring program modification. The engineering solutions are scheduled for completion in 2003.

MD188–58 Geology and Soils

Section 3.4.6.1 was revised to include the description provided.

MD188–59 Geology and Soils

Section 3.4.7.1.1 was revised to incorporate the concept that playas may become dry because the infiltration rate can exceed the water inflow rate.

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MD188-60

Waste Management

The rate that wastewater enters the Wastewater Treatment Facility is different from the rate at which treated water is discharged from the facility due to evaporative losses, losses through the liner of the lagoon, and water that is retained in the moist sludge from the treatment plant.

The remainder of this comment is addressed in response MD188–57.

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Text on page 4-221 states that the wastewater treatment plant capacity is 2.6 million L/day. Is that correct? Given the number of 0.9 million L/day (page 3-110) for inflow to Playa 1, and assumption that all Playa 1 inflow is from the treatment plant, then the plant presently must be operating at ~35 percent of capacity. Is this correct? Or is the treatment plant operating at 50 percent capacity (using table 3-28 number on generation rate instead of Playa 1 inflow rate)?

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. Section 3.4.6.1 General Site Description

Page 3-113, paragraph 5 "depth to the Ogallala groundwater aquifer varies from..... This flow direction....."

This section is poorly written and should be rewritten to demonstrate that the DOE understands groundwater hydrology at the site. First, the word 'aquifer' in Ogallala groundwater aquifer is redundant and confusing; is the reference to the water table or to formation structure. Second, the 'flow direction' is not stated; the word 'this' starting the next sentence has no antecedent. Third, the apparent comparison of the water table dip to the 'regional northwest-to-southeast trend (?) of the remaining portion of the Southern High Plains' does not make sense.

Section 3.4.6.1 General Site Description

Page 3-113, paragraph 6 "extent, thickness, and hydraulic characteristics of (the Dockum Group) have not been established"

Statement is vague or inaccurate. For a regional study that includes the Pantex Plant and a list of older references refer to Dutton, A. R., and Simpkins, W. W., 1986, Hydrogeochemistry and Water Resources of the Triassic Lower Dockum Group in the Texas Panhandle and Eastern New Mexico, Burcau of Economic Geology Report of Investigations No. 161.

Section 4.17.2.2 Waste Management
 Page 4-219, paragraph 4, Nonhazardous liquid waste generation is expected to increase
 by 5 percent of treatment plant capacity
 See comments no. 1 and no. 4 above.

Whether a 5 percent increase in wastewater generation has an impact on groundwater or surface water quality has not been addressed. See comment no. 1 above regarding the need for analysis of past experience in meeting or violating liquid waste discharge permits. Should one assume that the rate of violation will increase by 5 percent? Would that have a major impact? Is the issue here the impact on the treatment system or on surface water and ground water quality? What impact would a 5 percent increase in wastewater generation have on water quality in Playa 1 and in ground water? Would that be a minor impact or a major impact? Is a minor impact on the treatment system or water quality executable?

Regardless of whether this is addressed in the Storage and Disposition Final PEIS (DOE 1996a), this needs to be addressed here.

Section 4.17.2.2 Waste Management

Page 4-324, paragraph 1, lines 3-5

It is not acceptable to refer to the Storage and Disposition Final PEIS (DOE 1996a:3-498) with the statement that wastewater discharge would have no impact. This finding needs to be argued here. A similar comment on an unrelated matter was raised at public hearing in Amarillo August 11 by a member of the public.

MD188

MD188-61

Waste Management

As discussed in Section 3.4.2, the capacity of the Wastewater Treatment Facility is approximately 946,250 m³/yr (1,237,700 yd³/yr), with current wastewater discharges to the facility of approximately 473,125 m³/yr (618,848 yd³/yr). Therefore, current use is approximately 50 percent of capacity.

MD188–62 Water Resources

Section 3.4.7.2.1 was revised to incorporate corrections based on the commentor's observations.

MD188-63 Water Resources

Information on the Triassic Dockum Group found in Section 3.4.7.2.1 was taken from the information on Pantex provided in *Environmental Information Document: The Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components EIS* (ES:96:0156, September 1996). The particular reference in this SPD EIS to the Triassic Dockum Group underlying the Ogallala aquifer was taken from *Hydrogeology and Hydrochemistry of the Ogallala Aquifer, Southern High Plains, Texas Panhandle and Eastern New Mexico* (Texas Bureau of Economic Geology Report of Investigation No. 177, 1988) and *Natural Phenomena Hazards Assessment for the Pantex Plant, Amarillo, Texas* (Jacobs Engineering Group, Contract 05-G010-S-91-0211, Task 35, October 1993). However, the referenced report given by the commentor was reviewed, and Section 3.4.7.2.1 was revised.

MD188-64

Waste Management

The Waste Management sections of Chapter 4 of Volume I describe impacts to the waste management infrastructure. Impacts on water resources (including surface water and groundwater) are discussed in the Water Resources portions of Section 4.26.

Section 3.4.7.1 was revised to reflect the status of the Pantex sanitary Wastewater Treatment Facility upgrade. As described in that section, beginning in 2003, the Wastewater Treatment Facility will no longer discharge effluents to Playa 1. Effluents will be used to irrigate crops grown

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9. Section 4.17.2.2 Waste Management Page 4-324, paragraph 3

28 million L/yr of additional groundwater withdrawal is 4.5 percent of 1995 production rate (617 million L/yr [page 3-113]). Where does the number on 23 percent of groundwater capacity come from?

It is not acceptable to refer to the Storage and Disposition Final PEIS (DOE 1996a:4-686 to 4-687) with the statement that groundwater demand would have no impact. This finding needs to be argued here. Groundwater levels are declining because withdrawal exceeds recharge. Does the DOE assume that the Panhandle Groundwater Conservation District No. 3 will allow Pantex to exceed 1995 production rates? Is this assumption valid or founded on discussion with the District? The same comment applies to the statement on impact from operations in section 4.26.3.2.2.

 Section 4.32.3.3 Waste Management Page 4-401, Table 4-280

Table gives 15 yr production of 554,900 cubic meters of liquid nonhazardous waste. This averages ~37,000 CMY. Table 4-157 gave a number of 50,000 CMY for operations liquid waste generation. How has the savings of 13,000 CMY or 195,000 cubic meters during 15 years been achieved? If Table 4-280 understates waste generation rate by 35 percent, what impact does that have on the findings?

on the site in cooperation with the Texas Tech University Research Farm. Therefore, beginning in 2003, effluents from Pantex facilities will no longer impact the surface waters of Playa 1.

The remainder of this comment is addressed in response MD188–57.

MD188–65 Infrastructure

Note that page 4–324 of the SPD Draft EIS is part of Section 4.26.3.2.1, Water Resources, and not part of Section 4.17.2.2, Waste Management. This SPD EIS references the *Storage and Disposition PEIS* for impacts on groundwater quality, but does not rely on that EIS for impacts on groundwater capacity. The percentage cited in this SPD EIS is calculated from the addition of the construction-related water demand plus current usage divided by the site groundwater supply production capacity. Both the current usage and site capacity figures are cited in Table 3–36. Section 3.4.7.2.1 was revised for clarity and updated; it now better describes the relationship between the Panhandle Groundwater District 3 and groundwater use at Pantex.

MD188-66

Waste Management

Section 4.32.3.3 describes waste generated during both construction and operations. The total presented in the Cumulative Impacts section cannot simply be divided by 15 to determine the annual waste generation rate for each alternative. During construction of the pit conversion and MOX facilities at Pantex, 25,000 m³ (32,700 yd³) of liquid nonhazardous waste would be generated annually, for a total of 75,000 m³ (98,100 yd³) over the 3-year construction period. During operation of the pit conversion and MOX facilities at Pantex, 51,000 m³ (66,708 yd³) of liquid nonhazardous waste would be generated annually, for a total of 510,000 m³ (667,080 yd³) over the 10-year operating period. Thus, if both the pit conversion and MOX facilities were at Pantex, a revised maximum total of about 590,000 m³ (771,720 yd³) over the combined construction and operating period would be expected.

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